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July 31, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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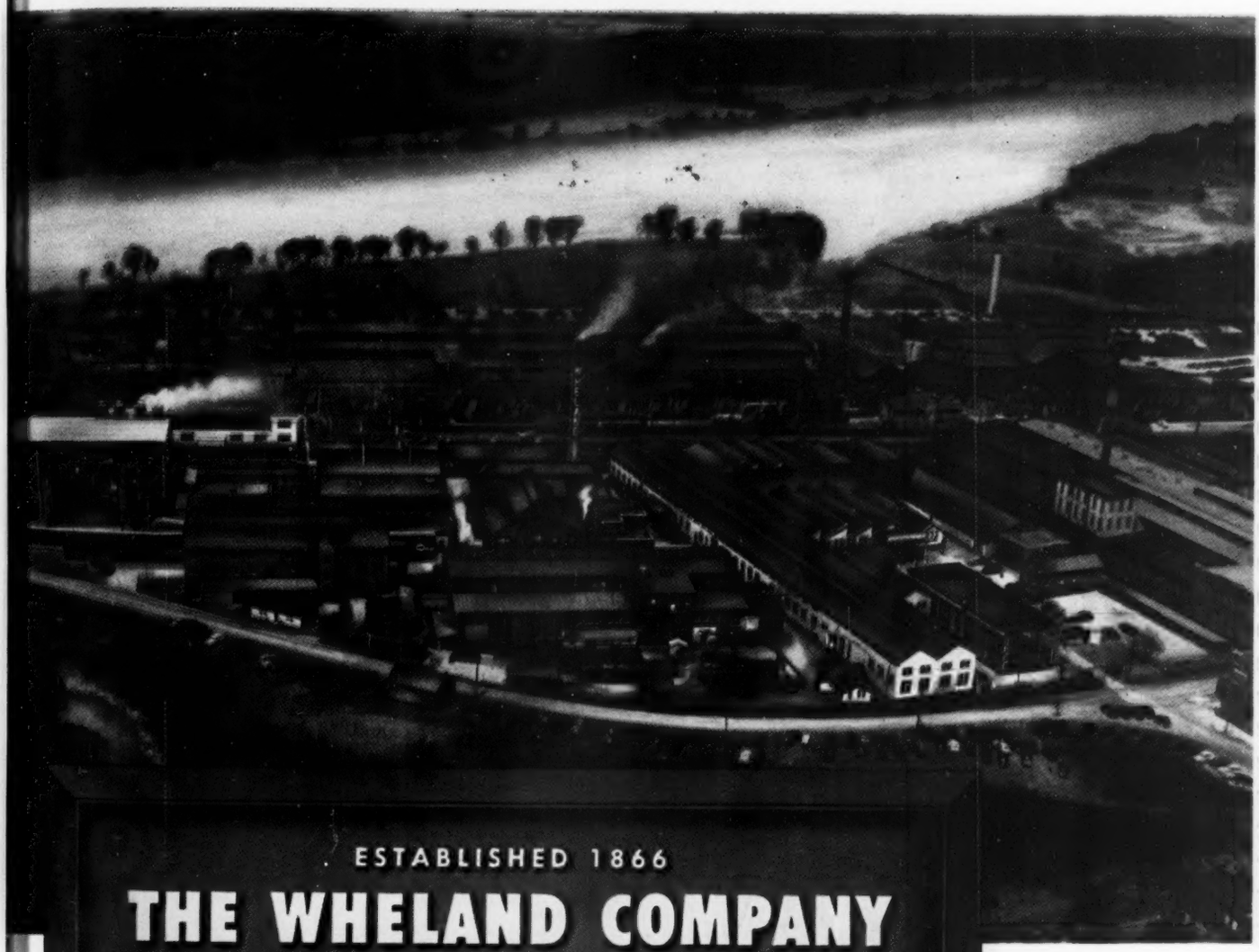

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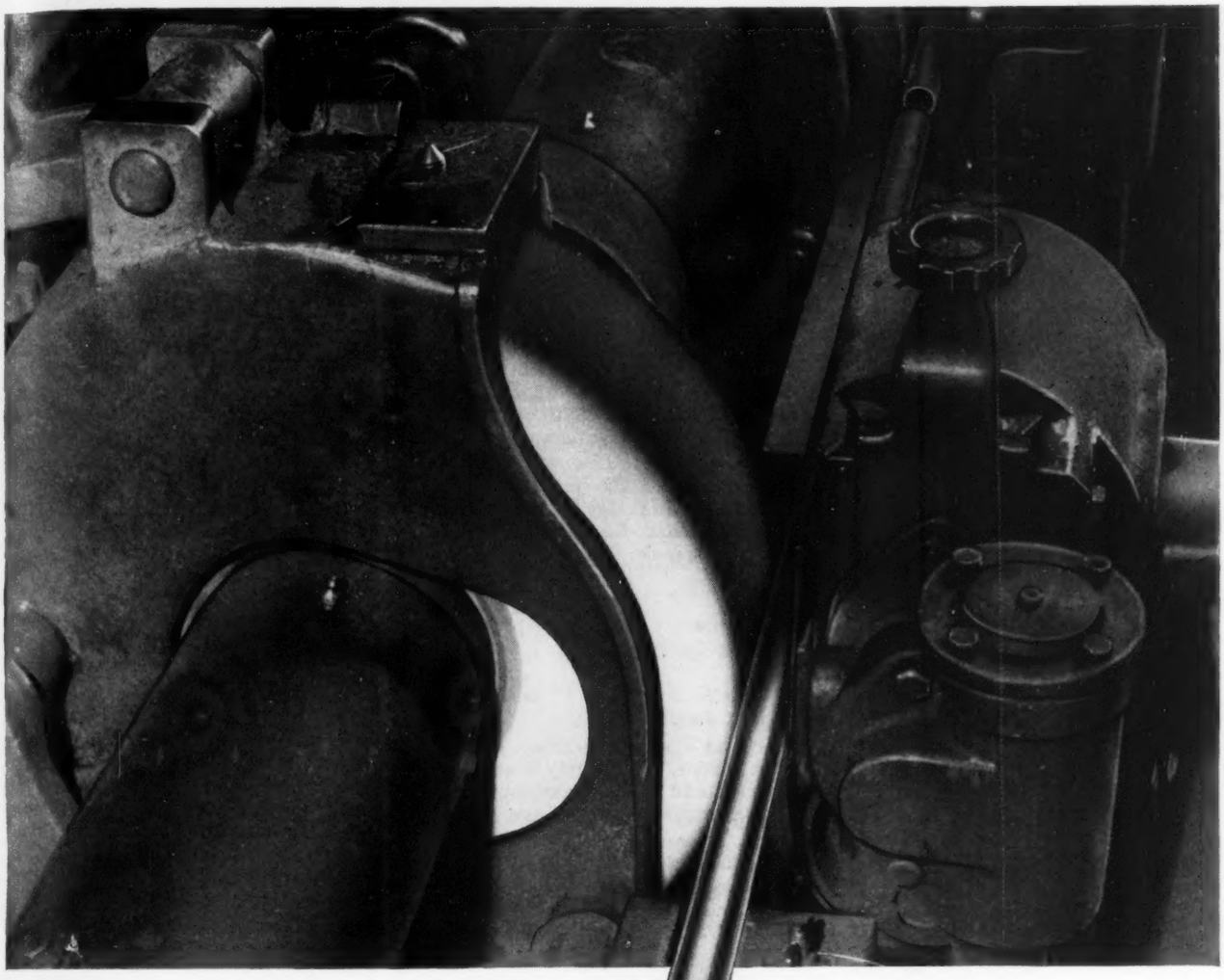

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Behind the Scenes...

Today Is Depreciation Day

To the east of us on page 42 begins Associate Editor John Morgan's third installment in the STEEL campaign for depreciation reform. It gives the Washington views on treatment of depreciation for tax purposes. It tells how you can help the cause and where you can expect the most resistance to reform.

More articles are coming. If you want reprints of this one, of stories to come or of the previous installments that ran May 8 and June 19, write Readers' Service Department, STEEL Magazine, Penton Bldg., Cleveland 13, O.

What's In a Name?

"What's in a name?" asks Romeo, or is it Juliet?

It was a great handicap to a woman named "Manila Bay," who never married and always complained that her name gave away her age.

But a name was no handicap to the fifteenth son of a Puritan named Barebone. The child was christened "If Christ Had Not Died For Thee, Thou Hadst Been Damned Barebone."

He grew up to be a doctor of divinity, honored as "Dr. Damned Barebone."

How To Lose Money Fast

Do you want to lose $500 an hour? Steel Plant Editor John Knox can tell you several ways to lose a lot of money fast.

He's just completed an unusual, behind-the-scenes study of what steel companies lose when their facilities are down.

Steel companies drop about $500 per hour when an average hot-rolled strip mill is down. That charge includes such costs as running water on the mill, continuing maintenance, etc.

When a blast furnace is down while the iron notch is being stopped or while changing a tuyere, monkey or tuyere cooler, the cost is $8 per minute.

For an open-hearth furnace, the down-time depends upon variables such as the size of the furnace, the operating equipment, etc. In round figures the cost of down-time is $60 per hour per furnace. While an open hearth is down, the furnace crew is standing by and the maintenance goes on. Incidentally, it costs $300 per day to maintain a 125-ton open hearth.

The down-time for an electric steel furnace costs $20 per hour with the current off and no charging of raw materials. That is equivalent to $14,000 a month based on a 700-hour operating month.

John Knox can show you how to make money, too. For more than 30 years, he's been writing for STEEL on cost-cutting and other developments in industry.

A Penny a Year

We have just received a half-dollar in the mail from Bethlehem Fabricators Inc. At first we thought Bethlehem Fabricators was trying to influence our editorial judgment, but we found we couldn't spend the money for beer and whiskey—too difficult to pry the coin loose from its money clip.

The 50-cent piece is the company's way of letting us know that for 50 years it has been supplying steel for construction.

Puzzle Corner

The fly in the July 17 puzzle flew 300 miles. First in with the correct answer were C. E. Blass of Talon Inc., C. I. Gardner of Orinoco Mining Co., Ralph Pappenheimer of Specialty Device Co., R. R. Rychener of National Gypsum Co., H. P. Rogers of Kleenaire Corp. and T. S. Bean of Barber & Ross Co.

Try this one: When lowering a ship from one level to another in the Panama Canal, the gates are closed and the water is let out. Assuming that the change of water per unit to time is a constant for all conditions of water level in the lock—which it is not—which ship would require a longer time to be lowered, a battleship or a destroyer?

Shrdlu

(Editorial Index—page 23)

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STEEL

The Magazine of Metalworking and Metalproducing

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July 31, 1950

Sidelight on Korea

Almost every day one reads in the newspapers statements by military men in Washington or Tokyo expressing wonder at the ability of North Koreans to maintain a steady flow of equipment and supplies to the front.

One wonders whether these persons have examined the information on the Far East sent to Washington since V-J Day. Before that day, Japan had created an imposing industrial potential in Manchuria. It had blast furnaces at Anshan and Pensihu, steelworks and rolling mills at Anshan and well balanced metalworking plants at Anshan and Mukden. It had a superlative coal mine and the world's largest shale oil operation at Fushun.

At the war's end three calamities visited these industries. First, native mobs—free from discipline—pillaged all plants. Secondly, Russians carted off nearly a billion dollars worth of the best machinery and equipment. Thirdly, the Communist Chinese army dynamited or otherwise damaged any facilities which the Russians had overlooked.

At this point timing becomes important. Early in 1948, the Communist army held most of Manchuria. The battle line was shifting rapidly into China. On Oct. 24, 1949, Angus Ward, U. S. Consul General in Mukden, was arrested by Communists on a charge of having beaten a Chinese employee. Thanks to a crusade by an American newspaper chain, our State Department was prodded into belatedly arranging for Ward's liberation in December, 1949.

But note this: Our consulate in Mukden had been isolated for a year previous to Ward's arrest. This means that from October, 1948, until June 27, 1950, the Soviets had 21 months in which to rehabilitate the extensive military facilities of Manchuria.

This was time enough to restore the two Mukden arsenals, Anshan and Pensihu iron and steel facilities and the scores of fabricating plants in Mukden and Anshan. Mukden, via a good railroad over the Yalu river, is less than 400 miles from Seoul. It is quite probable that the North Korean offensive is being mounted from substantial rehabilitated facilities at Mukden and Anshan and at Darien, the port which we with Britain gave to Russia conditionally without consulting China.

The rapid flow of tanks and supplies to South Korea—ugh! ugh! It's partly a result of our mistakes at Yalta and Cairo.

* * *

FIRST THINGS FIRST: To the great credit of American industry, let it be said that many of the corporations that eventually will produce whatever is necessary to discharge our commitments in Korea and elsewhere are far ahead of the government in morale, planning and execution. Dozens of corporations have tentatively allocated key personnel to manage plants for the manufacture of obviously needed war materiel. All that is lacking for a quick and direct move into war production are definite orders from the government to produce so many items of this or that.

While one army of government employees is working feverishly to prepare these orders, another is working hard to determine to what extent government controls over industry may be necessary. Opinion on controls varies widely. In one school are persons like the respected elder statesman Bernard Baruch who believe all-out controls at the beginning will work best. In an opposite school are persons who believe war re-

(OVER)

quirements will represent such a small percentage of our national capacity that wholesale controls would do more harm than good.

We've got to gamble. If this proves to be a long, hard war, we will wish we had followed Baruch's advice. If it is a limited war, we will wish we had imposed limited controls.

At this particular moment, however, getting orders placed would seem to have priority over final determination of what kind of controls we need. —pp. 31, 32, 33

* * *

SEEK ORDERS LOCALLY: These are days when many industrial executives feel an impulse to rush to Washington to inquire about war orders or conversion plans. The advice of experts is "don't do it." They point out that you probably would waste your time and money.

For one thing, Washington bureaus and agencies as yet have practically no useful information on definite conversion plans. As for actual war orders, most that have been placed so far have been handled through field procurement offices of the Defense Department. Smaller manufacturers, particularly, have a better chance of getting orders by watching notices of military procurement awards posted locally at Commerce field offices, chambers of commerce, trade associations, etc. than by trying to work through Washington. Also much of the war work that eventually will be placed will flow to smaller companies through subcontracts. —p. 41

* * *

HOW YOU CAN HELP: In a third article on depreciation reform, John S. Morgan surveys opinion in Washington on this important problem. He finds that support for more liberal depreciation policies can be found in the Department of Commerce, Defense Department, among most Republican senators and among a few Democratic senators. Apathy is found among many Democratic senators and in the National Security Resources Board. Resistance can be expected in the House Ways & Means Committee and in the Treasury Department.

In view of the stand-pat attitude of the Treasury, the only chance for depreciation reform is through legislative action. The presently constituted Congress is not likely to act favorably on depreciation reform until it is faced with one of two problems: One, necessity of stimulating production for war; two, consideration of a long-range tax policy.

Meanwhile you can help speed the day of reform by giving your senators and congressmen specific figures on how a liberalized depreciation policy would permit your company to strengthen the national economy. —p. 42

* * *

BETTER NEWS AHEAD: Although it is natural to feel disappointed that we have so little to show for our billions of dollars spent for military purposes during the past five years, it is possible that some of the experimental work that has been done will prove important in the end. Some of the automobile companies have been working closely with military personnel on army tactical vehicles and ordnance items. Some of these projects are far enough along so that production can be pushed rapidly.

Typical are the vehicles covered by contracts with the Dodge Division of Chrysler amounting to $25 million. Another is the Army Ordnance vehicle known as the "Eager Beaver," for which Reo has orders amounting to $55 million. These represent the combined skills of military experts and practical manufacturers. When we know the full story of what has been going on in the improvement of war equipment, the picture may be more promising than it is today. —p. 45

* * *

NEW STEELS PAY OFF: Cost-conscious manufacturers in the metalworking industry are finding that use of the so-called "super machining" screw stock steels is resulting in advantages far greater than anticipated. These free-machining steels are of two general types. One is an improved bessemer steel with a lower carbon content than the regular B-1113 steel as normally produced. Several steel producers have brought out steels of this type within the past year. The other "super" free-machining steel is a lead-bearing rephosphorized and resulphurized open-hearth product introduced in 1938.

Automatic screw machine shops have accumulated a sufficient amount of experience with these steels to prove definitely that compared with conventional free machining steels they permit much longer tool life, reduced down time, higher cutting speeds and feeds, better finish and increased operating efficiencies. In some cases these advantages add up to increases in production of an almost unbelievable 100 per cent. —p. 60

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

CONVERSION—The big question now is: How much conversion, how soon? The partial answer (p. 31) can be had by rephrasing the query: How little conversion, how late? Indecision among federal agencies, the three-to-six months' lag time required to translate Congressional appropriations into military orders, and the concentration of the arms program in the aircraft industry which is not much of a factor in the civilian economy—all those factors mean that civilian production will not be affected much in the third quarter. By the end of the year, steelmakers estimate that perhaps 25 per cent of total ingot capacity will be needed for arms. President Truman indicates that rationing and price, wage and manpower controls will be postponed as long as possible.

TANKS AND PLANES— When industry finally does get the green light on arms production, the big contracts will first come for tanks and planes. Tank production now coming mainly from the Detroit Arsenal, is a drop in the bucket (p. 32). Private companies that may shift to making tanks and tank parts include General Motors Corp., Continental Motors Corp., Chrysler Corp. and American Car & Foundry Co. Congress is being asked to appropriate more than $5.5 billion for military aircraft (p. 33). Conversion of the aircraft companies to war production should be relatively fast because the industry has a lot of idle capacity.

UP TO THE HILT—The race for production, materials and workers is on (pp. 48-51). The scramble for materials is not the free-for-all it was right after World War II, but shortages are increasing. Factory employment rose to 14.6 million in June, a 250,000 increase from May.

LABOR SHOWS ITS MUSCLE—Labor leaders are working hard to have a big say-so in industrial mobilization planning (p. 38). Union chieftains have the President, the National Security Resources Board and the Labor Department lined up on their side. Congress is more independent but labor is fighting for the status quo on legislation already on the books that will come in handy under a war economy, particularly the Walsh-Healey Act that permits the labor secretary to set minimum wages for employers working on government contracts.

GET THE LEAD OUT— The Korean war has improved the chances for legislative action on tax depreciation reform, but you still must hammer away at Washington inertia (p. 42). No move is likely now, but get set for the long-range tax bill coming up before Congress late this year or early next. Then the government may want to encourage expansion for war production. In World War II, a five-year amortization plan spurred output.

SILVER LINING— The Korean situation has its brighter side (p. 36). It is stimulating European production so much that the need for ECA help is less pressing. The Economic Cooperation Administration may eventually evolve into the agency handling the Point 4 program to aid underdeveloped areas.

GOLD IN STEEL— Heavy demand, an expansion in capacity and higher prices boosted the aggregate net earnings of 13 steel ingot producers to $264,909,372 in the first half of 1950, a 24 per cent increase over the corresponding period last year (p. 35). Much of the jump came in the second quarter when the industry was operating at 100.4 per cent of capacity.

HERE AND THERE IN INDUSTRY—Die programs for 1951 automobile models are fairly well completed, and new models will be introduced this fall and winter despite possible interruptions for war production (p. 45) . . . You may be wasting time and money by rushing to Washington for war orders (p. 41) . . . Remington Arms Co. and Crucible Steel Co. of America are forming a new company to market titanium products (p. 34) . . Prices have gone up in some electrical equipment lines (p. 35) . . . A major steel company has booked an order for rocket bodies.

Production-Engineering News—p. 59 *Market Summary—p. 99*

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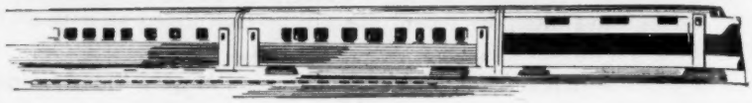

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HI-STEEL lasts longer on the job. Its tight scale resists atmospheric corrosion four to five times as long as ordinary structural-grade carbon steel. It has been known to resist 12 times as much abrasion as ordinary structural-grade steel.

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COMPARISON OF *AVERAGE* PROPERTIES OF HI-STEEL WITH ORDINARY STRUCTURAL GRADE CARBON STEEL

Tensile Properties (¼" Plate)	Inland HI-STEEL	Ordinary Structural Grade Carbon Steel
Yield Point (psi)	56,000	35,000
Ultimate Strength (psi)	73,000	66,000
Elong. in 8" (%)	25	25
Endurance Limit		
Fatigue Strength (psi)	49,000	33,000
Impact Resistance (Charpy Impact—ft. lbs.) Temperature		
80° F	55	36
32° F	43	33
0° F	36	26
—25° F	34	6
—50° F	30	2

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Conversion—How Much, How Fast?

Washington moves slowly on expanded arms program while industry awaits word on what is expected of it. Impact on civilian production in third quarter will be slight

FEDERAL agencies are playing by ear on industrial mobilization while metalworking executives are tapping their toes wondering what's going on.

As subject to change as "The Basin Street Blues" in a jam session is the answer to the question: Conversion—how much and how fast? Discordant notes sound in Washington as federal agencies struggle with their solos and Congressmen try to get together on mobilization legislation.

What's the Theme?—But out of the hubbub, industry can just barely detect this theme: Conversion to war production will be on a gradual, piece-by-piece basis. Military and semi-military steel needs may require as much as 25 per cent of total ingot capacity by the end of this year, but scarcely any big Korean-engendered metalworking war orders have yet been placed.

Although the $10.5 billion President Truman requested for the Defense Department can buy a lot of metalworking products, civilian output may not noticeably be affected before the fourth quarter because:

1. Three to six months are required to translate Congressional appropriations into military orders with XYZ Mfg. Co.

2. Defense has not yet made up its mind on what equipment it wants.

3. About $3.3 billion of the appropriations will go for aircraft. The aircraft industry never has been a big factor in the postwar civilian economy, so its expansion will cause less disruption than if it had been supplying a big demand for commercial planes.

4. About $185 million will go for ship construction, another industry that has not been an important factor in the postwar civilian economy.

Let George Do It—In the absence of any clear directives from Washington, the steel industry has started its own informal allocations system and is rushing shipments of any steel it knows is going for defense. Producers of aluminum, another material slated for controls, are doing the same thing. Chances for voluntary allocations now appear good, although Congress is not expected to enact the Defense Production Act of 1950 before the middle of this week at the earliest. If the Korean situation stabilizes, Congress will be far more leisurely about enacting controls.

Federal agencies say they can't work in concert on conversion directives until Congress acts. That may be, but even when Congress writes the score, nobody knows who will conduct. On paper, the National Security Resources Board is the co-ordinator of mobilization. Because of its long dormant status, many mobilization functions had been and still are being exercised by other agencies—Defense, Muntions Board, etc.

Steel Adequate for War

There'll be plenty of steel to take care of any war emergency!

That's the assurance from Irving S. Olds, chairman, United States Steel Corp.

No war project suffered during the last war for want of steel, he points out. None will suffer this time, for, he explains: 1. Ingot capacity in the United States is 11 million tons above the peak war year of 1944; 2. more capacity is being built; and 3. this nation's capacity now is 13.6 million tons over what all the rest of the world made last year.

Initial demands for defense or war, whichever it may be, will not be anything like what arose prior to World War II, thinks Mr. Olds. Then we had to build arsenals, military depots, shipyards and ships as well as arms and ammunition. "It is highly unlikely that we will have to duplicate that effort today," he believes, for many of the arsenals, depots, shipyards and ships still are available.

U. S. Steel has received few orders directly connected with current defense work. Government work has amounted to only about 1 per cent of the corporation's total business since the first of the year, Mr. Olds revealed. While he expects a spurt in war requirements will bring need for some system of priorities he believes such a system should be set up on a voluntary basis, sponsored by the industry working in conjunction with some government agency. He is confident a compulsory system will not be needed.

Inland To Build Open Hearths

Inland Steel Co. will enlarge its steelmaking capacity to 4,500,000 net tons of ingots annually from its present rating of 3,750,000 tons. It will construct a new open hearth shop with four 250-ton furnaces at its

AIR MAIL—SPECIAL DELIVERY: A scarce item of aircraft quality steel is supplied in record time by U.S. Steel Supply Co.'s St. Louis Warehouse. The steel was requested by the Tinker Air Force Base at Oklahoma City, Okla., for use in modifying military planes for combat duty. A telephone request at 11:15 a.m. was filled and ready for loading aboard a waiting C-47 by 2:25 p.m.

Indiana Harbor Works in East Chicago, Ind.

Enlargement of some of the present open hearths will round out the 4,500,000-ton ingot capacity, officials explained.

No additions to blast furnaces or finishing mills are contemplated.

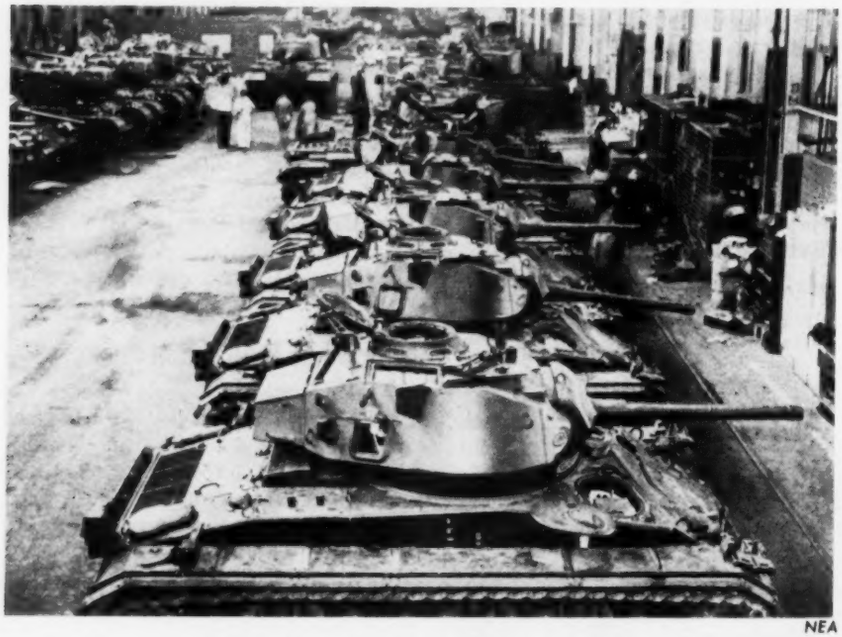
The Tanks Are Coming

Private industry getting set to supplement government's outturn of Army tanks. Cadillac selects key personnel to handle job it expects to get

"MORE ARMS for America" is the battle cry from Washington. That means more tanks. How many of what size, Washington hasn't said.

But any sizable program of tank building is a job for the metalworking industry.

At present the principal source of tanks is the Detroit Arsenal, which for many months has been reconditioning M-4 General Sherman tanks returned from battlefields of World War II, along with building a heavier model, the 45-ton General Patton.



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ARMY ORDNANCE'S DETROIT ARSENAL
. . . tank output, though doubled, is puny

Not Enough to Stop Reds — The arsenal's output, however, is puny even though it is being doubled, for before the doubling the arsenal's combined production rate averaged only 12 a week.

Various companies which could build tanks have been negotiating with the government for assignments. One of them is Cadillac Motor Car Division of General Motors Corp. Since 1945, Cadillac has worked closely with the Detroit Arsenal in engineering development of new types of tanks, and a production contract is expected to be placed shortly for a "sensational" new type of light tank, now well past the blueprint stage.

Cadillac has selected key personnel to handle the job, which likely will be centered in the former Fisher Body bomber plant in Cleveland.

Tanks and Cars, Too—This pending tank contract will not affect current automobile production, says C. E. Wilson, president of General Motors. The company intends to set up the facilities in plant or plants not now used for automobile or parts production, he explains. Final effect, however, on the automobile business and other heavy goods industries of the country's defense program will depend on the magnitude of it and the demands this will make on manpower and raw materials, Mr. Wilson adds.

The new tank which Cadillac will build will have a transmission supplied by General Motor's Allison Division in Indianapolis. Engines will be provided by Continental Motors Corp., Muskegon, Mich. Use of Continental engines is in line with the extensive program of standardization the Detroit arsenal has worked out. Under this program, Continental will be the source of most power plants for tanks and other mobile ordnance. Continental has been making about 100 aircooled tank engines a month at its Muskegon plant.

Labor Force Expanded—Continental already is expanding its labor force at Muskegon, and Allison undoubtedly will be faced with doing the same, a problem complicated by the fact that Allison probably will have to boost its output of jet aircraft engines in Indianapolis.

Cadillac's contribution in creating military vehicles for the armed forces during World War II was highlighted by the engineering of more than six different types of armored vehicles. Of these, the M-5 light tank and the M-24 light tank were produced in quantity. They employed two V-8 engines, combined with a special Hydra-Matic transmission operating through a unique type of transfer unit which provided unusual speed and maneuverability.

Cadillac built its first production model on Mar. 31, 1942, after completing a pilot model in only 4½ months from the time it received authority from the Army. In eight months of 1942 after receipt of a production contract the company built 2974 units, and from March, 1942, to October, 1945, the count was 12,227.

Built by Chrysler—The $70 million Detroit Arsenal was built and operated by Chrysler Corp. during World War II. Later the arsenal was taken over by the Ordnance Department as the center of all mobile ordnance development. Operations there have been proceeding quietly but steadily; there are many projects well through the engineering stage and ready for activation on a moment's notice. They include many types of prime movers for artillery and radar units, chassis for self-propelled guns and tracked mounts for antiaircraft batteries.

Chrysler, which during World War II made 22,234 medium and heavy tanks and rebuilt thousands of others, has maintained continuous contact with the arsenal staff and conceivably could move into operation of the plant again should the need arise.

Await Go-Ahead — Among those negotiating with the government for tank production assignments is American Car & Foundry Co., New York. Charles J. Hardy, chairman of ACF, confirmed the report his company is working with Army Ordnance on a study of a design for production of combat tanks but said no definite contract for production has been made.

ACF, which during World War II contributed 17,034 light tanks to

British and American forces from its plants in Berwick, Pa., and St. Charles, Mo., is confident it could handle a large order without disrupting its other production. The company's railway equipment factories have been operating at only a fraction of capacity.

They Can Make Them—Baldwin Locomotive Works, Philadelphia, says it could quickly clean out and make available for active use its big tank factory of World War II, now chiefly used for heavy storage.

Pullman-Standard Car Mfg. Co., Chicago, says it has not been approached about making tanks again and indicates that with freight car orders picking up again it would rather not have to think of tanks.

Other tank makers in World War II included Pressed Steel Car Co. Inc., Chicago, Lima-Hamilton Corp., Lima, O., American Locomotive Co., New York, and Pacific Car & Foundry Co., Renton, Washington.

Tank components makers were legion in World War II. Mack Trucks Inc., New York, made transmissions; Wright Aeronautical Corp., Wood-Ridge, N. J., made engines; and steel armor was turned out by General Steel Castings Corp., Granite City, Ill., Union Steel Castings Division of Blaw-Knox Co., Pittsburgh, Continental Foundry & Machine Co., East Chicago, Ind., and American Steel Foundries, Chicago.

The accelerated program at the Detroit Arsenal and the imminence of the Cadillac tank program suggest that demands for rolled and cast armor plate will increase appreciably, along with requirements for engine and transmission parts, tank suspension elements, and electrical and fire control accessories.

ACF To Revive Buffalo Plant

American Car & Foundry will revive operations in its Buffalo plant in September. Idle since World War II, the plant will be used for production of restricted items for the Atomic Energy Commission.

The plant employed 2400 during the last war when it made shells for the Army and Navy, but the company says it has no immediate plans to operate on such a broad scale soon. ACF says 100 skilled workers would be employed. Nonferrous metal products to be made for AEC are part of an order placed with ACF long before the Korean conflict started, the company indicates.

Ravenna Ordnance Hires More

The Ravenna Ordnance plant near Ravenna, O., stepped up its employment by about 200 men since the Korean war. The plant renovates and reloads old artillery ammunition that was damaged or outdated. Built just before World War II, the big plant had employed up to 10,000 workers during the war.

$5.5 Billion for Air Power

Biggest slice of requested appriations would go for warplane production

THE DEFENSE DEPARTMENT will be putting emphasis on the old World War II slogan, "Air Power Is Peace Power": The Air Force will get the biggest slice of the $10,487 million that the President is asking for the armed forces.

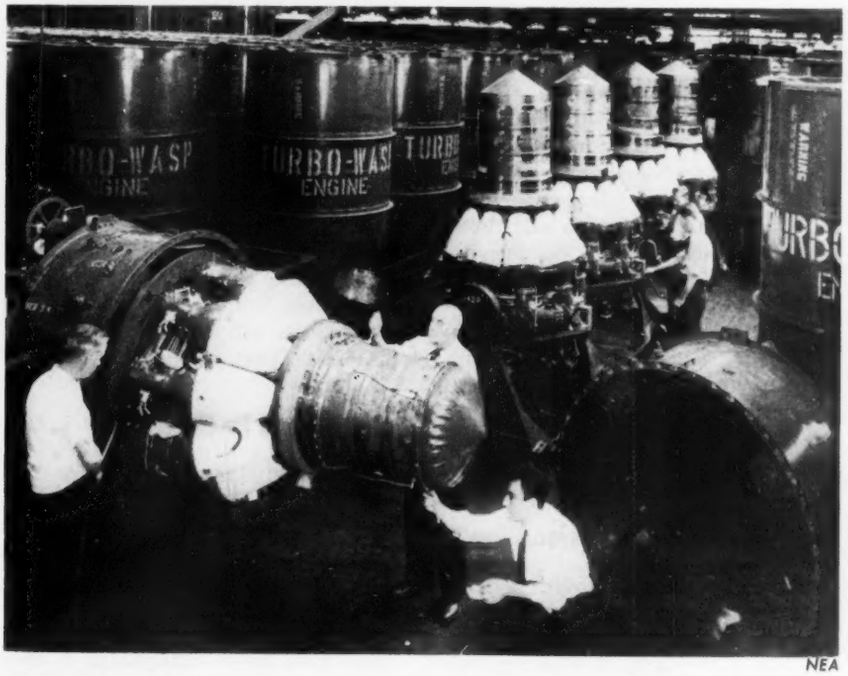
At present the appropriations bill for fiscal 1951 carries about $15 billion in cash and contract authority for the Defense Establishment. The new request will bring the total to over $25 billion. Of that figure over $5.5 billion would be used to buy military planes.

No 50,000 a Year—Although the indicated plan for plane production is hiked mightily, it falls far short of the early World War II program. The aircraft industry is pretty well fixed in plant capacity to take care of the immediate and some future needs of military-plane building: Of the 84 plants built by the government for aircraft production during the last war, 29 are still owned by the Air Force; the rest were sold to the aircraft industry. Sales contracts stipulated that contractors must maintain plants so they can be returned quickly to war production.

Seventy Groups—Last week the industry was girding itself for the in-

NEA

JET-PACKED POWER: Hydraulic Press Mfg. Co., Mt., Gilead, O., supplied the presses used to draw sheet metal parts for the combustion chambers of the new Pratt & Whitney Turbo-Wasp.



NEA

ONE FOR THREE: Another J-48—the Pratt & Whitney Turbo-Wasp—is inspected by engineers along the assembly line in the company's East Hartford, Conn., plant. Completed engines weigh less than 2000 pounds, but they deliver about five horsepower per engine pound at the operating speeds of the fighters they power. The engines are used on three new American military fighters

creasing production pressure that would be put on it. Glenn L. Martin Co. planned to remain in production through its previously scheduled vacation period July 29 through Aug. 13. In a telegram to its suppliers it requested that all possible shipments between Aug. 14 and Aug. 31 be moved up to the first two weeks in August.

The new aircraft request is expected to provide for a speedup for losses incurred in the Korean War and a general expansion of air strength in line with the Air Force's desire for a 70-group program. It would mean bigger military orders for almost every plane now being supplied to the armed forces.

Alcoa Boosts Buffalo Output

The Buffalo plant of Aluminum Co. of America is adding a second shift July 31 because of a sharp increase in orders for military aircraft engine parts from Allison Division of General Motors Corp.

Munitions Board Stockpile Gains

The Munitions Board's stockpile of critical and strategic materials on hand and on order now amounts to a little over 50 per cent of the total estimated $4 billion goal. Appropriations now before Congress will increase that to about 57 per cent by June 30, 1951.

Purchasing programs for 13 materials are either fully completed or nearly so, the boards says in its semiannual report to Congress. Those materials are antimony in the liquated, metal and ore forms; metal grade bauxite, celestite, emetine, graphite (amorphous lump), hyoscine, iodine, lead, mica (muscovite splittings), quinine and sperm oil. Four other materials, pepper, baddeleyite, rutile and zircon, have been removed entirely from the buying list. Buying of five materials has been suspended and will not be resumed unless a review now being made proves the need for it. Those materials are agar, chromite (refractory grade), mercury, tantalite and vanadium.

Westinghouse Conversion Plan

Under a plan approved by the Munitions Board nearly two years ago, conversion to full military production in 68 plants of Westinghouse Electric Corp. could be set into motion overnight, President Gwilym A. Price says. Vice Chairman George H. Bucher is responsible for co-ordinating Westinghouse preparedness planning with that of the board and other government agencies.

Is This Power Necessary?

"WHY do you want this, Mr. President?"

That in effect is the question Irving S. Olds, chairman, United States Steel Corp., raises over "The Defense Production Act of 1950" which President Truman wants Congress to pass.

The measure, arising out of the deterioriating international situation, is construed by many observers as not simply an emergency measure but one that gives the President authority to nationalize American industry in whole or in part.

Title 2 of the bill provides that "Whenever the President determines (1) That the use of any equipment, supplies or component parts thereof, or materials or facilities necessary for the manufacture, servicing, or operation of such equipment, supplies, or component parts, is needed for the national defense, and (2) That such need is immediate and impending and such as will not admit of delay or resort to any other source of supply, he is authorized to requisition such property or the use thereof for the defense of the United States upon the payment of just compensation for such property or the use thereof to be determined as hereinafter provided."

"Existence of a national emergency," says Mr. Olds, "is no justification for a grant of authority by Congress permanently to nationalize American industry in whole or in part.

"Why such a provision should be needed in view of the magnificent production record achieved by American industry, under its skilled and experienced private management, in the last war, I cannot see, nor can I understand why any responsible individual or group of individuals in Washington should advocate it seriously at this time," Mr. Olds says with concern.

Mothball Fleet Is Adequate

Don't look for any immediate spurt in construction of new commercial-type ships. The Maritime Commission says vessels from the mothball fleet will probably be adequate to serve immediate shipping needs.

Commercial shipyards, though, can expect increased repair work. Up for Congressional consideration now are bills allotting $25 million for repairing mothballed ships. Maritime people think funds will eventually be appropriated for that purpose.

Coke Ovens To Be Rebuilt

Carnegie-Illinois Steel Corp. will rebuild two coke oven batteries, Nos. 13 and 15, at Gary, Ind. No. 13 battery, consisting of 77 ovens, will be returned to operation by December. No. 15 will be rebuilt by next May.

Since the war, U. S. Steel subsidiaries have been engaged in a coke oven rehabilitation program. One new battery was built at Gary, one at Clairton, Pa., three at Lorain, O., and one at Cleveland. Seven batteries are being rebuilt at Clairton.

Armco Develops Thin Steel

Steel so thin it take ten layers to equal the thickness of a human hair—that's the new product of the Research laboratory of Armco Steel Corp., Middletown, O.

Need for a super-thin alloy with special magnetic properties came with the development of high-frequency electronic equipment. Navy officials and electronic manufacturers asked Armco to produce the material. Armco rolls the alloy on a specially built mill whose work rolls are only 5/16 inch in diameter. The mill reduces the strip to 0.00025 of an inch in thickness.

Remington, Crucible Form Firm

Remington Arms Co. Inc., Bridgeport, Conn., and Crucible Steel Co. of America, New York, will form a jointly owned company to produce and sell titanium metal and titanium metal alloy products. The products include sheets, rods, tubes, wire, forgings, castings and other fabricated forms for industrial uses.

Sales of titanium will be handled from Remington's offices now, but all operations will eventually be moved to Pittsburgh. While some of Crucible's facilities will be used to proc-

ess titanium products, there will be no change in the normal steel operations in the Crucible plants.

Electric Equipment Prices Up

Electrical equipment manufacturers announced price increases in several lines last week caused by higher materials costs. Allis-Chalmers Mfg. Co., Milwaukee, raised prices, effective July 24, on all electrical products 10 per cent, except on power transformers and meter voltage regulators which rose 7.5 per cent.

An across the board 10 per cent increase on its entire electrical line was put into effect on July 25 by Crocker Wheeler Electric Mfg. Co. division of Elliott Co., Jeannette, Pa. Westinghouse Electric Corp., Pittsburgh, boosted control and transformer prices by 10 per cent, effective after midnight July 25.

Toronto Plant May Resume

Negotiations are under way for resumption of operations at the Toronto, O., plant formerly owned by Follansbee Steel Corp. These facilities, including four 50-ton basic open hearths and an eight-inch bar mill, were purchased by Kovalchick Industries Inc., Indiana, Pa., late last year. A large automotive concern is reported to be actively interested in the venture as a sheet bar supply source.

Steel Earnings Climb

Heavy consumer demand, rise in capacity and higher prices help set new records

THE METALWORKING industry's heavy demand for steel helped ring up new records for first-half earnings among steel producers.

This demand coming after a substantial expansion of steel producing capacity and an increase late last year in steel prices pushed aggregate net earnings of 13 ingot producers to $264,909,372 (see accompanying table and chart) in the first half of 1950, a 24 per cent increase over the corresponding period of last year.

Even though last summer's short-lived recession cut second-quarter earnings in 1949 from those of the first quarter, the industry produced at a slightly higher rate in the first half of 1949 than in the first half of 1950.

The situation suggests heavy demand alone did not put first-half earnings in 1950 above those of the like period of last year; other factors that can be pointed to are an increase in capacity and a general increase in steel prices last December. In the first half of 1950 steel production averaged 95.5 per cent of capacity; in the first half of 1949, the average was 96.4 per cent.

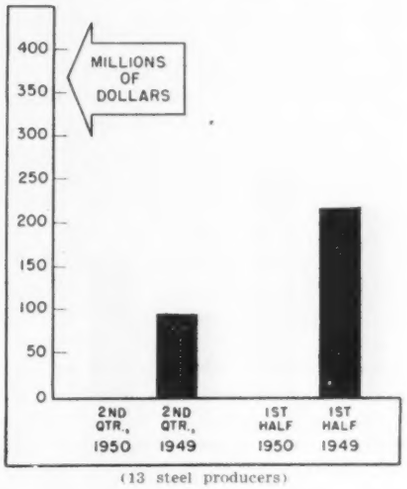
Aggregate net earnings of the 13 producers rose in the second quarter of 1950 to $153,884,090, a 38 per cent jump over the first quarter. The steel industry produced at 90.6 per cent of capacity in the first quarter and 100.4 per cent in the second.

Steel finishers shared in the rise in earnings, the accompanying table shows.

The producers of merchant pig iron experienced an improvement in earnings in the second quarter of 1950 but the first half was not as good for them as the first half of 1949.

Up Go Steel Earnings

. . . 24 per cent in first half



(13 steel producers)

Steel Producers' Net Earnings

	2nd Qtr., 1950	1st Qtr., 1950	1st Half, 1950	2nd Qtr., 1949	1st Half, 1949
U. S. Steel Corp.	$69,861,496	$49,217,742	$119,079,238	$44,123,595	$94,052,265
Republic Steel Corp.	21,080,742	16,621,334	37,702,076	10,178,544	25,477,171
Jones & Laughlin Steel Corp.	11,005,142	5,309,828	16,314,970	5,300,004	15,168,899
Youngstown Sheet & Tube Co.	10,785,832	7,490,941	18,276,773	9,020,705	21,043,365
National Steel Corp.	15,614,351	13,434,455	29,048,806	11,115,132	25,868,907
Inland Steel Co.	12,143,291	9,320,463	21,463,754	7,033,304	16,287,534
Wheeling Steel Corp.	4,648,449	3,187,696	7,836,145	2,128,432	6,138,569
Granite City Steel Co.	1,671,673	1,201,879	2,873,552	774,449	1,595,467
Sharon Steel Corp.	2,959,607	1,633,630	4,593,237	517,490	3,422,792
Allegheny Ludlum Steel Corp.	2,300,490	2,270,681	4,571,171	17,806	1,560,001
Continental Steel Corp.	870,719	840,071	1,710,790	210,719	413,805
Copperweld Steel Co.	457,746	185,721	643,467	130,842	1,221,479
Rotary Electric Steel Co.	484,552	310,841	795,393	299,700	1,321,752
Totals	$153,884,090	$111,025,282	$264,909,372	$90,850,722	$213,572,006
FINISHING CAPACITY ONLY					
Acme Steel Co.	$1,693,889	$1,602,290	$3,296,179	$1,111,680	$2,398,528
Superior Steel Corp.	258,090	134,406	392,496	*181,534	*286,179
Thomas Steel Co.	452,127	405,535	857,662	257,933	726,575
Washington Steel Corp.	190,796	135,120	325,916		
PIG IRON CAPACITY ONLY					
Interlake Iron Corp.	$1,625,338	$1,294,375	$2,919,713	$1,199,842	$2,957,035
Sloss-Sheffield Steel & Iron Co.	1,156,325	579,209	1,735,534	512,402	1,387,742
Woodward Iron Co.	1,533,959	1,007,320	2,541,279	1,075,086	2,753,397

*Net loss.

Europe's Boom May Ease ECA Needs

The Korean war is helping to spur European production. The dollar gap is closing, and the need for ECA help lessens. ECA may shift to Point 4 work

THE KOREAN cloud has one silver lining. It's helping to stimulate European industry to such an extent that the dollar gap is closing, economic recovery is proceeding more rapidly than expected and the need for ECA help is less pressing.

ECA officials in Washington last week termed as "a good subject for conjecture" the possibility that the Economic Cooperation Administration's energies may be diverted, possibly to the administration of the Point 4 program to aid underdeveloped countries, now handled by the State Department. An act of Congress would be needed to shift ECA over to the Point 4 program, but Point 4 and ECA activities in aiding Korea and underdeveloped dependencies of Europe are coinciding more.

Change in Plans—The ECA program for Western Europe, of course, will not be completely stopped before the official termination date in mid-1952, but it may be curtailed.

The ECA dollar total of purchase approvals for recovery goods and services during the fiscal year ended June 30 was $3,592,100,000. As of July 25, ECA purchase approvals since the program began amounted to $9,548,090,000. In fiscal 1950, $670.2 million went for machinery and equipment, $217.1 million for nonferrous metals and products, $97.4 million for chemicals and related products, $86.4 million for iron and steel mill materials and products, $76.1 million for metallic ores and concentrates and $72.4 million for motor vehicles, engines and parts.

Uncle Sugar—As of June 30, ECA had granted since the program began: $2562.1 million to the United Kingdom, $2010.1 million to France, $1058.1 million to Italy, $895.5 million to West Germany, $873.1 million to the Netherlands, $490 million to Belgium-Luxemburg, $442.5 million to Australia, $360.6 million to Greece, $208.8 million to Denmark, $195.5 million to Norway, $130.7 million to Ireland, $103.5 million to Turkey, $96.8 million to Sweden, $31.4 million to Portugal, $27.3 million to Trieste and $15.4 million to Iceland.

Ruhr Steel Mills Booked Ahead

West German steel mills are booked nearly to capacity and are no longer accepting orders from the U. S. The largest and most recent order placed with Ruhr firms is for 100,000 tons of pig iron. Pig iron, steel bars, wire rods and wire nails are the chief products going to America.

German textile, paper and pulp manufacturers are also being flooded with American orders. At this rate, the German dollar gap will be closed more quickly than expected.

Ruhr steelmakers are stepping up their campaign for more investment funds. They claim they must spend over $400 million to catch up technologically. They are particularly alarmed at the French expansions. Since the war France has built 29 blast furnaces, 12 open hearths, 5 electric steel furnaces, 18 rolling mills, 15 sheet mills and two broad strip mills.

Ruhr steel plants turned out 1,117,000 tons of steel in June and produced at a rate above the ceiling of 12.2 million tons per year. Steelmen are betting that the ceiling will be lifted soon.

The new West German ad valorem tariff rates provide for an 18 per cent duty on steel bars and all rolling mill products except sheets which has a 28 per cent rate. The average rate on steel imports in 1937 was about 25 per cent.

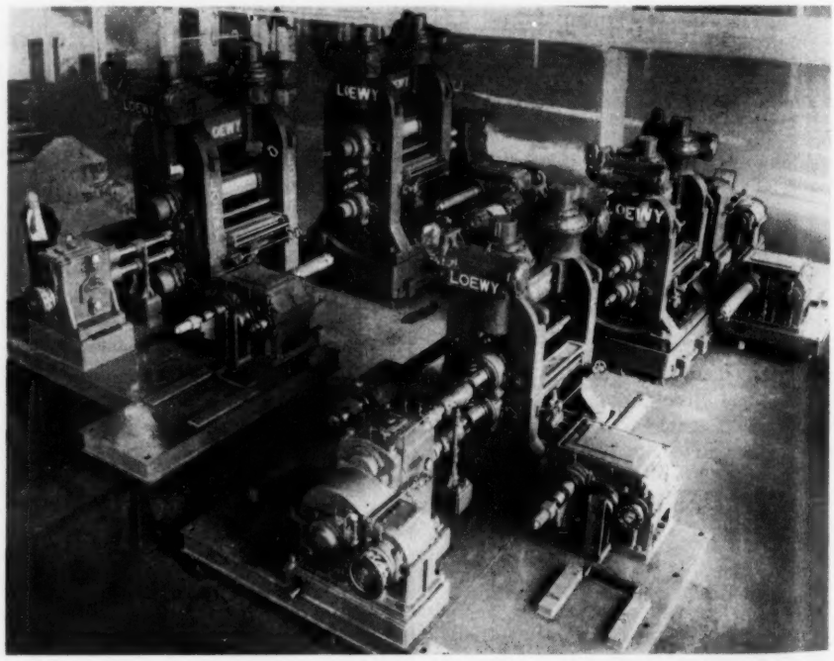
Korea Spurs French Industry

The Korean war is spurring French industry. Machine tool makers, especially, are booming. Auto manufacturers hit alltime highs in May and June, and the July production should be comparable. The industry is turning out about 23,500 autos a month. Industrial prices are stable, although the franc is again showing signs of queasiness, mainly because of the unstable political situation.

Belgium May Benefit

If the dissension in Belgium over the return of King Leopold III doesn't result in widespread strikes, the nation will cash in on Europe's industrial boom.

Reorganization on a limited scale of the old steel cartel, Comptoir Belgo-Luxemburgeois, is likely by October. Benelux steel producers have already agreed on domestic prices and plan to extend the agreement to export quotations in the fall.



OFF FOR THE CONTINENT: Two large high speed rolling mill installations built by Loewy Rolling Mill Division of Hydropress Inc., New York, for leading French companies are being shipped to Europe. They are two 4-high running-down cold mills and two 2-high finishing mills designed for rolling down of aluminum foil to minimum 0.00025 inch at a delivery speed up to 3000 feet per minute. Several of Hydropress' high speed foil mills are operating in the Western Hemisphere and others are under construction

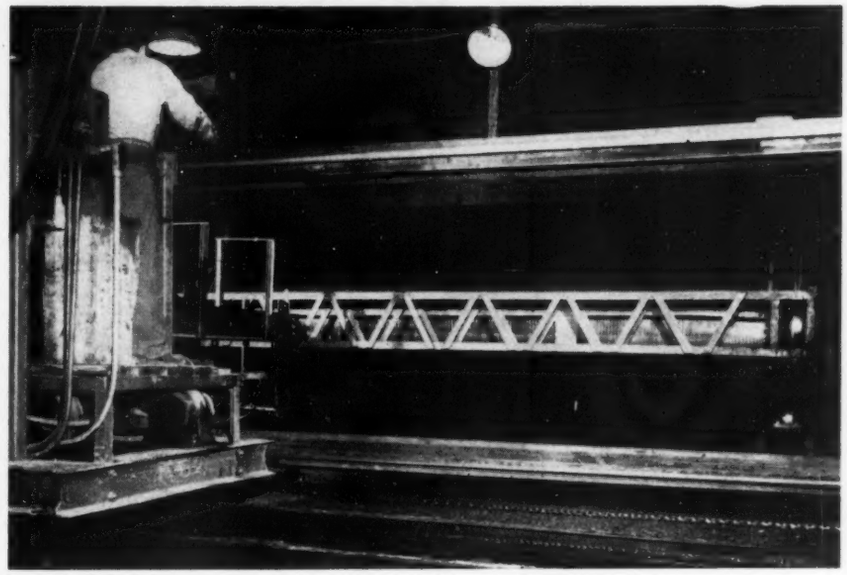
Ferroxcube Organized

New ferromagnetic ferrite used in cores and transformers will be principal product

SPRAGUE Electric Co., North Adams, Mass., and Philips Industries Inc., Hartford, Conn., jointly formed Ferroxcube Corp. of America. Headquarters will be in New York.

Robert C. Sprague, newly elected president of the Radio-Television Manufacturers Association, was appointed president of Ferroxcube. John P. Adams, is vice president in charge of sales, and T. James Reed is manager of the factory. It is located at Saugerties, N. Y. Financial details of the corporation were not disclosed.

The new corporation will make Ferroxcube, a new ferromagnetic ferrite that is particularly useful as a core material in high frequency coils and transformers. Production is expected by early September. Ferroxcube was originally developed by Philips research laboratories in Holland. By reducing electrical losses in components it makes possible higher efficiency, smaller circuits, more compact construction and lower production costs for radio and television receivers.



PIPE STRETCHER: Lock Joint Pipe Co. is using oil tempered spring steel wire to make concrete pipe that can stretch. The wire, made by Jones & Laughlin, is wound helically under uniform high tension around the outside of the steel cylinder putting inside concrete core of prestressed concrete cylinder pipe in compression. The construction makes the pipe able to resist high bursting pressures, reduces the use of steel and lowers the weight of pipe while giving it greater backload resistance

B & W Adds Mill

Babcock & Wilcox Tube Co. added a new mill for production of electric resistance welded tubing at the company's Alliance, O., plant. The new mill was the third such unit for the Welded Tube Division at Alliance; it will produce tubing with outside diameters ½ inch and up and with wall thicknesses 20 gage and heavier.

The company also made an increase in the size range of its seamless steel tubing at its Beaver Falls plant. After modifying certain of its existing facilities, B & W now can produce seamless hot finished tubing in outside diameters up to 9⅝ inches and seamless cold drawn tubing in outside diameters up to 8⅞ inches. The former maximum OD was 8⅝ inches.

Training Program for Tinnerman

A training program that prepares new salesmen to serve as fastening experts and consultants was inaugurated by Tinnerman Products Inc., Cleveland, maker of the Speed Nut fasteners.

The new program was started by H. R. Russell, general sales manager for Tinnerman, as an extension of the firm's policy of employing sales engineers to help customers solve fastening problems and develop savings in assembly costs. A major feature of the program is the use of visual aids: Vu-Graph projector, sound slides and motion pictures. All proceedings of the course were recorded and transcribed and will be incorporated in new sales manuals for use by future sales trainees.

IH Presents 12 New Models

International Harvester Co. introduced 12 new six-wheel truck models with many important engineering and structural changes, W. C. Schumacher, motor truck division general manager announces.

The models, elements of International's L-line, were built specifically to meet a wide variety of needs, he says. Major features of the model changes include: A new third differential mounted on the forward tandem axle; new valve-in-head engines; a new steering system; new steel-flex frames; new transmissions; new bogie-to-frame mounting and dual drive axles.

New Name: Newark Gear Inc.

William F. Hoffman, president, announced the purchase of Newark Gear Cutting Machine Co. which was renamed Newark Gear Inc. Plant and offices are in Newark, N. J. New additions to the company's line of gear cutting equipment will be announced soon by Leonard Smith, vice president in charge of sales.

Food Machinery Buys Propulsion

Food Machinery & Chemical Corp., San Jose, Calif., bought Propulsion Engine Corp., Kansas City, manufacturer of rotary power mowers and two-cycle gasoline utility engines. Final purchase arrangements were made in the middle of the month but FMC officials did not disclose the price.

The newly acquired concern will be operated as an integral part of the parent company's Bolens Products Division, producer of garden tractors at Port Washington, Wis. The division's nation-wide sales organization will be used to supplement already existing outlets of Propulsion.

Buffalo Bolt Merges Affiliates

R. B. Flershem, president of Buffalo Bolt Co., announces the merger into Buffalo Bolt of its operating affiliates, S. M. Jones Co., Toledo, O.; Eclipse Lawn Mower Co., Prophetstown, Ill.; and Penberthy Injector Co., Detroit.

The name of the company is now Buffalo-Eclipse Corp. The operating units of the company will operate as divisions of Buffalo-Eclipse Corp.

Salem Tool Building Addition

Salem Tool Co., Salem, O., is building a plant addition 60 x 140 feet to give the concern more working space, President J. A. Wilson says. He estimates the building alone will cost about $50,000.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Organized labor is moving fast to get an inside track on industrial mobilization. It has the NSRB and the Labor Department in line and is working on Congress

ORGANIZED LABOR is moving quietly but rapidly to assure itself of an important, if not dominant, role in industrial mobilization.

At least four developments indicate that labor chiefs are hard at work pulling strings in Washington.

1. Your Presence Is Requested—The National Security Resources Board first called representatives of labor, not industry, for consultation when the need for greater industrial mobilization became apparent.

2. Silence Is Golden — President Truman's message to Congress on the war situation had plenty to say about controls on industry, but not a syllable about controls on labor.

3. Croquets, Peas and Ice Cream—The Labor Department has started on the union convention banquet circuit plumping for "equal representation" for labor on mobilization agencies. John W. Gibson, assistant secretary of labor, is one administration man campaigning for the union cause. In a speech before the CIO's Glass, Ceramic and Silica Sand Workers of America in Milwaukee, he said:

"Take heed from the conduct of the last war. At the outset, complete co-operation between industry and labor in managing the mobilization task was apparently assured by naming General Motors' Knudsen and Labor's Hillman as co-partners of the program. This partnership did not last too long. Labor finally wound up with equal representation only on the War Labor Board. Labor must be named as a full partner with industry this time."

4. By the Back Door—Labor already has—and it's fighting to keep—one indirect influence on industrial mobilization. That's in determining minimum wages for government contracts. The Walsh-Healey Public Contracts Act permits the secretary of labor to set minimum wages for employers contracting with the government to furnish supplies and materials in excess of $10,000. That provision is significant because:

1. Federal war materiel buying is already increasing and will soon skyrocket.

2. Secretary of Labor Maurice J. Tobin is sympathetic to the unions, to put it mildly.

3. Mr. Tobin is now reviewing the 20 wage determinations made for industries who supply goods or services to the government. Minimum wage determinations for eight industries already have been raised. The latest was for the aircraft industry, at $1.05 an hour. The aircraft order shows that Walsh-Healey minimums have no relation to the national 75-cent minimum under the Wage-Hour Act.

The U. S. Chamber of Commerce calls the Walsh-Healey's wage-fixing provisions "a thorn in the side of businessmen" and "administrative legislation at its worst." It seeks repeal of that part of the act. The unions are fighting the chamber to the last ditch.

NSRB Appoints Labor Consultant

Mrs. Anna M. Rosenberg, New York labor relations expert, has been appointed a special consultant on manpower problems to NSRB's W. Stuart Symington.

During World War II, Mrs. Rosenberg was New York regional director of the War Manpower Commission and served as secretary of the President's Labor Victory Board. From 1944 to 1947 she was a member of the Advisory Board of the Office of War Mobilization and Reconversion.

NLRB Rules on Hiring Halls

The National Labor Relations Board rules that a union may lawfully operate a hiring hall under the Taft-Hartley Act, provided it does so without discrimination against employees because of their union membership or lack of it.

A majority of the board made the ruling in a case involving Pacific American Shipowners' Association and the CIO's National Union of Marine Cooks and Stewards. The ruling was made in determining whether or not the union had engaged in an illegal refusal to bargain during the 1948 West Coast maritime strike when it insisted upon such a non-discriminatory hiring arrangement. The board exonerated the union of that charge.

Herzog Renamed NLRB Chairman

President Truman has nominated Paul M. Herzog for a second five-year term as chairman of the Na-

NEA

A LOT OF COMPANY: A full tank company of the U.S. Army consists of 22 tanks, two 2½-ton trucks, six Jeeps, one halftrack, one recovery vehicle, 142 enlisted men, six officers and one warrant officer. The figures include the administrative, mess, supply, transportation, maintenance and filler personnel. The M-26 "Pershing" tank is now the standard tank in operation in the Army. It has a fuel capacity of 191 gallons of 80 octane gasoline, over 45 gallons of oil and 22 gallons of water and one .50 caliber machine gun. It has a road speed of about 30 miles per hour and is propelled by a 500-horsepower, 8-cylinder, V-type liquid-cooled Ford Model GAF engine. The driver's and fighting compartments are provided with forced ventilation and are heated

tional Labor Relations Board. The nomination was referred to the Senate Committee on Labor & Public Welfare.

The new term covers the period, Aug. 27, 1950, to Aug. 27, 1955. Mr. Herzog first assumed office as a member of the board and as its chairman on July 5, 1945.

Don't Rush to Washington

Don't rush to Washington to seek war orders or conversion information.

You'll probably be wasting time and money because Washington agencies as yet have little conversion information and because most war contracts thus far let have not been awarded in Washington, but through field procurement offices of the Defense Department.

Smaller manufacturers have the best chance to participate as subcontractors in the government's accelerated purchasing program by following up notices of unclassified military procurement awards available weekly at more than 2000 outlets, including Commerce field offices, chambers of commerce, trade associations, state development and industrial commissions, state employment offices and state and local manufacturers' associations.

Over 110 Trade Leads Listed

American foreign traders will find trade leads on products listed for export and import ranging from prunes to planes and from paper folding fans to windmills in the current issue of Foreign Commerce Weekly. Over 100 specific leads are in the listing of export, import, business agency, foreign investment and licensing opportunities issued by Commerce Department's Office of International Trade

The issue also has a detailed list of products from Western Germany to be displayed at the Chicago International Trade Fair.

'Foreign Trade Practice' Out

A guide to basic reference sources on the practical aspects of foreign trade is given in a new publication issued by the Office of International Trade. It's the pamphlet, "Foreign Trade Practice (Reference Sources)," which replaces "Foreign Trade (Basic Information Sources)." The booklet gives an up-to-date listing of governmental and nongovernmental publications about foreign trade practice.

It was prepared by Helen Houck and is well worth the 20 cents that the Commerce Department charges for it. You can get copies from field offices and from the U. S. Commerce Department, Washington 25.

Commerce Revokes China License

The Commerce Department revoked all outstanding validated export licenses covering shipments to the mainland of China. That was done in accordance with the current policy of denying exports of strategic materials to the general area of military operations in the Far East. But licenses for exports to British Hong Kong, Macao, Formosa and South Korea were not included in the action. Revocation applies only to commodities on the U. S. Export Control "Positive List."

Destination Controls Placed

Additional destination controls were placed on exports of oil and gas production equipment and parts, petroleum refinery equipment, components and parts and glass-working lathes, Commerce's Office of Industry and Commerce announced.

Through this action validated licenses are now required for shipments of those items valued at over $100 to all destinations except Canada. Formerly, the licenses were required for shipments valued at over $100 only to destinations outside the Western Hemisphere.

$1.5 Million for Machine Tools

The Export-Import Bank, foreign lending agency of the U. S. government, extended new credits of $405.5 million in the fiscal year ended June 30.

Credit went to private enterprise, banks and governments to finance transactions related to American foreign trade.

Among the new credits set up during the six months' period ended June 30, 1950, was a revolving credit of $1.5 million to short-term finance sales of machine tools to different Latin American countries.

Net earnings of the bank for the fiscal year were $49.1 million, the semiannual report of the bank shows, even after providing for all operating expenses and interest to the U. S. Treasury on borrowed funds, all of which went to increase the bank's accumulated earnings reserved for possible future losses to $203.1 million on June 30, 1950.

Sabotage Film Released

"Guarding Against Sabotage," an Army training film illustrating how attempts to destroy industrial facilities can be combatted, is being made available to industry, Defense Department officials announce.

The film was prepared by the Army Signal Corps for the Provost Marshal General of the Army. Prints of the film may be borrowed from the signal officer of the army area in which the borrower resides: First Army, Governors Island, New York; Second Army, Ft. George G. Meade, Maryland; Third Army, Ft. McPherson, Georgia; Fourth Army, Ft. Sam Houston, Texas; Fifth Army, 1660 E. Hyde Park Blvd., Chicago; Sixth Army, Presidio of San Francisco, Calif.; and Military District of Washington, Washington 25.

Mercury Mine Investigated

In 121 years—from 1824 to 1945—the New Almaden mercury mine in Santa Clara county, Calif., produced over a million flasks (about 76 million pounds) of quicksilver. The record was exceeded by only three other mines in the world, the Almaden in Spain, the Idria in Austria and the Huancavelica in Peru.

The information comes from Report of Investigations 4697, "Investigation of the New Almaden Mercury Mine, Santa Clara County, Calif.," which may be had from the Bureau of Mines' Publications Distribution Section, 4800 Forbes St., Pittsburgh 13.

The historic mine was investigated by the bureau during the last war in search of additional reserves of mercury and to develop information that would serve as a guide for prospecting in nearby unexplored areas.

Big Cities' List Grows

At least 15 cities joined the ranks of places with over 100,000 population, a preliminary report to the Bureau of Census from Commerce Department field offices of the 17th Decennial Census reveals.

Only one city fell from this ranking among the 92 listed in the class in 1940. To date there are 106 cities in the 100,000 or over classification.

Lowell, Mass., was the city that fell from its 100,000 population pedestal. The 15 new cities on the list are:

Austin, Tex.; El Paso, Tex.; Mobile, Ala.; Shreveport, La.; Baton Rouge, La.; Savannah, Ga.; Berkeley, Calif.; Evansville, Ind.; Corpus Christi, Tex.; Allentown, Pa.; Montgomery, Ala.; Phoenix, Ariz.; Waterbury, Conn.; Pasadena, Calif.; and Little Rock, Ark. Texans will note that the Lone Star state adds three new sparklers to its diadem.

Hammer Away at Washington Inertia on

Depreciation Reform

By JOHN S. MORGAN
Associate Editor

WHAT'S the government's attitude toward tax depreciation reforms? Will the dangerous international situation push the government into a more liberal depreciation policy?

These and other questions were asked by STEEL in a survey of Washington opinion. The survey reveals:

1. Depreciation reform can come through legislative action only. The Treasury Department could reform the matter by an administrative about-face, but it won't.

2. Depreciation won't be touched now by a Congress preoccupied with mobilization matters, including a stop-gap tax bill. Chances are better for reform late this year or early next when a long-range tax bill comes up. Then, the government may want to encourage expansion for war production. In World War II, a five-year amortization plan spurred industrial output.

3. War or no war ,the cause is gaining ground in Washington, but it still faces an uphill fight.

Increased Communist military activity will probably spur reform of depreciation tax laws, but it could harm the cause if it precipitates hasty legislation or if, because of it, Congress decides depreciation changes would cause too great a temporary revenue loss at a time when the government needs every dime it can get. Both people in and out of government agree that liberalizing depreciation provisions would result in a short-term federal revenue loss.

Where in Washington can you and other metalworking executives find support for more liberal depreciation policies?

In the Commerce Department

In the Defense Department.

Among Republican, even a few Democratic Senators.

Where will you find apathy?

Among many Democratic Senators.

In the National Security Resources Board.

Where can you expect resistance?

In the Treasury Department and the Bureau of Internal Revenue.

In the House Ways & Means Committee influenced by the Treasury.

The Commerce Department is the most ardent proponent of a more liberal depreciation policy in the President's official family. Unfortunately, Commerce is a step-child or worse of the administration.

Commerce Secretary Charles Sawyer says: "I think that an amortization or depreciation provision in the present tax structure that would stimulate the purchase of new equipment is highly desirable." The Commerce position on depreciation can be pieced together from Mr. Sawyer's testimony before various Congressional committees. It's this: Industry should be allowed to depreciate over five years unless the normal life is less, as with vehicles. Any rate pattern adopted must be kept unless a change is permitted by the Bureau of Internal Revenue. Commerce thinks that in the long run, such a five-year policy will make little difference in revenues.

Some Commerce people feel that the biggest gyp is loss of depreciation in loss years. (Depreciation can be credited only against profits.) The carry-forward and carry-back provisions in corporate tax laws relieve this a little, but the device is too cumbersome. A simpler remedy: Change the law to permit depreciation charged in a loss year to be applied against profits in any succeeding year.

The Defense Department ordinarily would have little to do with depreciation, but now its say-so is more important because it needs to be equipped by industry. Defense personnel hit the "burden of proof" provisions under the present set-up as hobbling industry. A taxpayer now must prove his claims. Defense people say that puts an unnecessary burden on industry and that the proof must be up to the Treasury as it was before 1934.

"Don't let the Treasury bluff you," Defense people say. They think many depreciation claims would be approved if industry puts up a hot argument when the Bureau of Internal Revenue demurs.

Sen. Homer E. Capehart (Rep., Ind.) is enthusiastically in favor of more liberal depreciation. His bill now before the Senate provides for five-year amortization, similar to the program adopted in World War II, although his measure would be on a permanent basis. Commerce approves of it, with some modifications. Senator Capehart told STEEL "to keep plugging away at the problem. You're doing a lot of good." STEEL ran two other depreciation articles, in the May 8 and June 19 issues.

Sen. Ralph E. Flanders (Rep., Vt.) says STEEL's campaign for depreciation reform is indicative of increasing interest in a difficult subject. Senator Fland-

ers says, "Ideally, the solution would be to pull all stops on depreciation—let industry do what it will." But that wouldn't be politically acceptable, so he would go along with some sort of limitations, such as a five-year amortization program.

Sen. Robert A. Taft (Rep., O.) favors more liberal depreciation, but legislation affecting the matter should have "painstaking study."

Sen. John W. Bricker (Rep., O.) says that the present tax depreciation policy "is just another of the administration's co-ordinated efforts to hit industry."

Some Democrats favor more liberal depreciation, although they are cautious in their statements. Sen. Paul H. Douglas (Dem., Ill.) says: "Yes, accelerated depreciation would probably stimulate capital investment, but it might create other problems even more serious. The matter needs closer study by Congress than it has thus far received."

Sen. Joseph C. O'Mahoney (Dem., Wyo.) says he's "interested" in the subject, but he won't go further. In several published reports on hearings in which he has participated, he has gone on record as favoring more liberal depreciation.

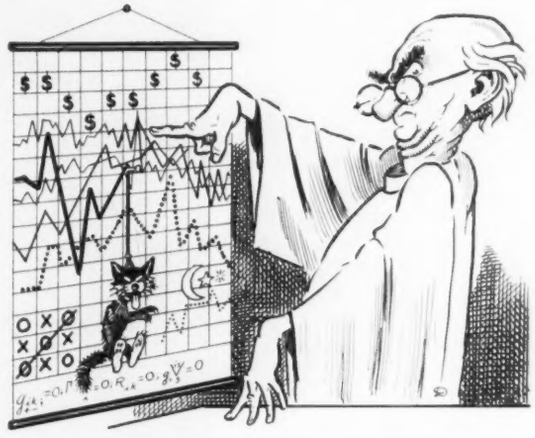
One problem in the battle for depreciation reform is: How to surmount the inertia and apathy toward the subject found among many senators, representatives and administration people. STEEL's campaign "is helping by making more federal personnel aware that a serious problem exists," says an administration man.

The trouble about depreciation is this: It's a difficult subject, but the difficulty is often exaggerated by some congressmen who blindly accept the Treasury Department's thinking on the matter as gospel.

Apathy and inertia in Washington also stems partly from outside sources. Colin F. Stam, chief of staff of the Joint Committee on Internal Revenue Taxation, points out, "There's no uniformity of opinion outside government on what should be done about depreciation." Can Congress come up with a satisfactory program of reform when practically no two people agree on what a satisfactory program is?

Another area of apathy is in the National Security Resources Board. That came about largely because of the prolonged leaderless status of the board. Now that W. Stuart Symington is chairman, you can hope for improvement.

But there's no hope of improvement or change in attitude of the Treasury Department. "When you think of bureaucrats, think of the Treasury." That statement comes not from industry, but from administration people.



Treasury High Priests Make a Mystery of Depreciation

The Treasury is standing pat on depreciation. Even though it has not been overhauled since 1942, Bulletin F will not be changed. F is the Bureau of Internal Revenue's guide that most of industry must follow in alloting the life span of its equipment for depreciation purposes. The present depreciation policy has been evolved from years of experience, says the Treasury. Schemes for reform may help some isolated cases, but the very device to cure one problem may cause many other difficulties, Treasury claims.

Treasury admits that much of industry has been hurt by prices rises. "That's regrettable," says the Department, "but everyone must take their chances. Are insurance companies asked to pay 150 to 200 per cent on policies sold before the war?" The Treasury dismisses index schemes to circumvent inflation as "interesting but impractical." Treasury includes the Ernst & Ernst proposal reported in STEEL June 19.

The Treasury opposes shifting the burden of proof in depreciation matters from the taxpayer. It says it had experience with shouldering the burden of proof itself from 1926 to 1934; the administrative difficulties were mountainous.

Some members of Congress and administration people charge that the Treasury and the bureau overcomplicate depreciation. "They set themselves up as high priests of depreciation," is the charge, "and with economic double talk surround the subject in an aura of mystery understandable to the initiate only."

The House Ways & Means Committee has been impressed with Treasury's performance; hence, depreciation reform has a bleak outlook there unless the Republicans or more sympathetic Democrats move in.

WHAT CAN you do to speed Congress' approval of wise legislation on tax depreciation?

1. Badger your Congressmen with specific cases, not vague, general complaints.

2. Let the Treasury know how you feel. Do that through field or Washington representatives. The Treasury says it has heard no unusual complaint, says nothing is wrong.

3. Present the case for depreciation reform through local Chambers of Commerce. They're respected and listened to in Washington.

4. Get your trade associations and chambers talking more on the matter to foster greater unanimity of opinion on what should be done. Congress needs a more organized body of suggestions for reform before it will act.

For new equipment or changeovers

HYATTS PREFERRED

In the specifications now being prepared for the new mill tables, cars, cranes, motors, etc., you'll find more and more steel men writing in "Hyatt Equipped."

And in the extensive mill improvement programs also underway, you'll find many Hyatt Roller Bearings being "built-in" to replace obsolete plain bearings.

Proving that whether it's in the design of new equipment or for changeovers on existing equipment, steel men everywhere have learned that they can depend on Hyatts . . . the preferred steel mill bearings. Is there any application data you desire? Hyatt Bearings Division, General Motors Corporation, Harrison, N. J., Chicago, Ill. and Pittsburgh, Pa.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Die programs for 1951 models fairly well completed and new models will be introduced this fall and winter despite possible interruptions for war production

DETROIT

PRICE tag on a set of front fender dies these days runs pretty close to $300,000, and finishing touches are being put on a number of them for 1951 passenger car models. That is, of course, a hefty expenditure to make in tooling but is the result of fenders growing steadily larger and more complex in shape, often requiring as many as ten or twelve press operations.

Several of the contemporary fender styles require welding a cone-shaped blank before the first draw in order to form the lamp housing which is a difficult shape to work up in a press.

Shops producing these large dies for fenders and roof panels now find it necessary to have the dies ready for production runs on delivery, whereas some years ago it was the usual practice to try them out on the press line and do what "barbering" was necessary before the first stampings were produced.

But right now it is not possible to keep press crews idling around while tryout work is in process, so the die shops have to do the tryout themselves before they even dare to ship the dies.

This has made it necessary for some shops to install large tryout presses, calling for a considerable investment in equipment since these double-action and triple-action presses cost several hundred thousand dollars. Hence the sharply higher costs of today's automotive tooling.

New Models Coming—Die program for the '51 models are fairly well completed and if it had been known six months ago that the market would continue hotter than a firecracker and that a war production program would develop, some of the new dies might have been forgotten. Once they are started, however, it is not possible to call off the program. So there will be the usual changeovers being made later this summer and on through the fall months.

Two, Hudson and Nash, probably will be the next to switch to the 1951 styling, Packard being already rolling. Plymouth is scheduled to be the first of the Chrysler units to change, and the General Motors divisions likely will defer their start until November or, perhaps, even to December.

Ford Modernizes Press Plant

Ford has initiated a long-range program of modernization and rehabilitation of its pressed steel operations in the Rouge plant. The work will be completed by 1952 and is expected to increase production efficiency and improve working conditions. Major improvements will include installation of a considerable amount of new equipment, rearrangement of present equipment and facilities and construction of two large interfloor ramps designed to speed the flow of materials. Other changes will involve the improvement of material handling and warehouse and storage facilities. As planned, the project will not interfere with the pressed steel plant's production schedules. Over 40 per cent of the Ford pressed steel operations eventually will be centered at the new Hamburg, N. Y., plant now under construction. This will permit some freeing up of space at the Rouge.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	732,161	508,101
June	890,000*	523,689
Six Months	3,934,019*	3,034,055
July		604,351
August		678,092
September		657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
July 8	137,731	118,611
July 15	194,073	156,436
July 22	190,615	160,173
July 29	185,000	138,727

Estimates by Ward's Automotive Reports

* Preliminary.

$25 Million in Army Orders

Dodge Division of Chrysler has disclosed that government orders for army tactical vehicles now on the company books call for a total cost of more than $25 million. These orders were received in two contracts. The first was covered in the government's fiscal budget ending June 30, 1949, and provided for a total of 2490 cargo, troop transport and ammunition carrying trucks at a cost of some $14 million. The second was in the budget ending June 30 of this year, and provided for 2751 more vehicles, including ambulances and specially designed maintenance trucks at a cost of about $11 million. Five pilot model cargo trucks were delivered to the army early this year and passed tests at the Aberdeen, Md., proving ground, and at Fort Knox, Ky.

Army Ordnance personnel worked closely with Dodge engineers in the design and development of these new trucks. They incorporate not only the lessons learned in the battle use of several hundred thousand trucks during the last war but also the experience which the company has had with its peacetime adaptation of the vehicles. Among improved features are better steering, springing, transmissions and transfer case. All units are of the ¾-ton four-wheel drive type, equipped with 94-horsepower engines, 112-inch wheelbase and 16-inch clearance (about twice as much as the average passenger car.)

Of particular importance in their military use, the vehicles can ford streams with engines completely submerged, and can operate under all climatic conditions including Arctic and tropical extremes. Most are equipped with blackout lights, drop seats for carrying personnel and winches with 7500-pound line pull capacity. The units have a high degree of parts interchangeability both among themselves and with Dodge models delivered to the army previously. In addition to actual production, the two contracts also cover Chrysler's responsibility in the design and development of the vehicles, the creation of the necessary tools to build them, replacement parts and the technical

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manuals, parts lists and other published material involved.

Reo Unveils Eager Beaver

Reo has taken the wraps off a new Army Ordnance vehicle—a 2½ ton truck built for high speed on and off the highway and designed to operate normally as mentioned in connection with the Dodge trucks. Known as the Eager Beaver, production models of the M-34 are now moving from company assembly lines in Lansing, Mich. Contracts for 5000 were placed a year ago, and 3900 more in June of this year, total costs running to $55 million.

The Eager Beaver will do the following: Carry a 10,000 pound payload on a highway at 60 mph, take such a load up a 60 per cent grade, maintain speed of 30 mph on a constant grade of 3.8 per cent, cruise for 340 miles at 35 mph, carry a 5000 pound load cross-country or off the highway, operate over a temperature range from 65 below zero to 125 above, and ford a stream up to 7 feet deep.

Snorkel and Snorter—The truck is equipped with two extension pipes for underwater operation, one a "snorkel" for air intake to the engine and the other a "snorter" for exhaust. With these projecting above the surface of the water, it is only necessary for the driver to keep one foot on the accelerator, his hand on the wheel and his head above water. Thus the truck might be driven off a landing barge into surf and go into immediate action under its own power.

Mechanically the new truck features a straight single-line through drive with one output shaft to the rear and the other to the front axle. angularity of propeller shafts is reduced and ground clearance increased through the use of a top-mounted double-reduction final drive. Another unusual feature is a new type of transfer case containing provision for automatic engagement of the front axle drive. A double over-running clutch on the front output shaft, combined with a reduction gearset, drives the front axle output shaft at a lower speed than that of the rear output shaft regardless of the direction of the vehicle. As a result, positive drive to the front axle does not take effect unless the rear wheels slip or until sufficient windup takes place in the rest of the running gear to absorb the difference in ratio of output shafts.

Parts Interchangeable—Rear axles are interchangeable as complete assemblies. Other interchangeable components include: Rear axle housings, final drive assemblies, differential case halves, axle shafts, hub and bearing cup assembly, numerous parts on the bogies, brakes, brake wheel cylinders, brake drums, pinion oil seals, wheel bearing seals, inner and outer shell bearing cones, wheel bearing adjusting nuts and universal joint flanges. All chassis frame cross members are stamped from the same die.

The two-speed transfer case has constant mesh gearing and synchronized shift for both speeds. It also incorporates a power takeoff which can be operated while the truck is running or at a standstill.

K-F To Keep Willow Run

Flood of rumors to the effect that the government was planning to take over the Willow Run plant of Kaiser-Frazer Corp. is nothing more than that. There is ample production space available in the larger aircraft plants of the Pacific Coast and Southwest for any immediately conceivable military aircraft requirements, and beyond that it would probably be quicker to build a new plant and equip it than to tear out production equipment from Willow Run and retool it for aircraft.

K-F has announced scheduling of a 50 per cent production increase early in August. Current output of 800 cars daily will be boosted to 1200 by the addition of a second shift, hiring for which has already started. The new schedule includes the low-priced Henry J. model, and accelerated assembly of the two door Kaiser model which went into production this month. Output for June was 17,874, the highest month of the year and representing a 93 per cent increase over June a year ago. August schedules call for 22,000 units and this will be further stepped up to possibly 30,000 monthly by the end of the year. Next month also will mark the debut of two more Kaiser body styles, club and business coupes, and in September a two-door version of the Kaiser Traveler utility model will be started down the lines.

Ford Improves Parts Packaging

A streamlined packaging and merchandising program for parts and accessories is being introduced to Ford dealers. A new trademark—Fomoco—has been adopted and will be featured on all parts and accessories packaging. Months of research and consultations with design and packaging experts preceded the launching of the new types of cartons. Wherever possible, sealed-end cartons are used, and many small or semidelicate parts are packaged in fiberboard cans with sealed metal tops and bottoms to insure maximum protection. The packages show the parts enclosed, either by printed illustration, or by transparent windows.

New Alloy for Valves

Intake valves on DeSoto engines now are being made of a high-silicone-chrome alloy for longer life and reduced servicing.

FOMOCO: Earl G. Ward (left), manager of Ford Division parts and accessories operations, and James F. Mitchell, packaging, inspect an example of the company's new packaging design program for Ford parts and accessories. The parts-accessories program is now being presented under the new trademark, FoMoCo for Ford Motor Co.

ANOTHER REASON *why* Firestone STAINLESS STEEL STAMPINGS COST LESS

LOOKING for a specialist in stainless steel stampings? Then drop a line to Firestone Steel Products. Large-size stainless steel stampings go down the product lines at the rate of 2,000,000 annually. That's *big* volume for *big* stampings. And *big* volume means *big* savings in production and handling costs. These savings are passed on to you — naturally, prices are lower.

For stainless steel stampings — or any metal fabrications — it will pay you to figure with Firestone. For complete cost analysis of stampings or assemblies send drawings or blueprints to Firestone Steel Products Company, Metal Stampings Division, Akron 1, Ohio.

Listen to the Voice of Firestone every Monday evening over NBC

Integrated Facilities for Large Size Stainless Steel Parts or Assemblies

- ★ Automotive Trims
- ★ Appliance Accessories
- ★ Food Machinery Parts
- ★ Food and Beverage Containers

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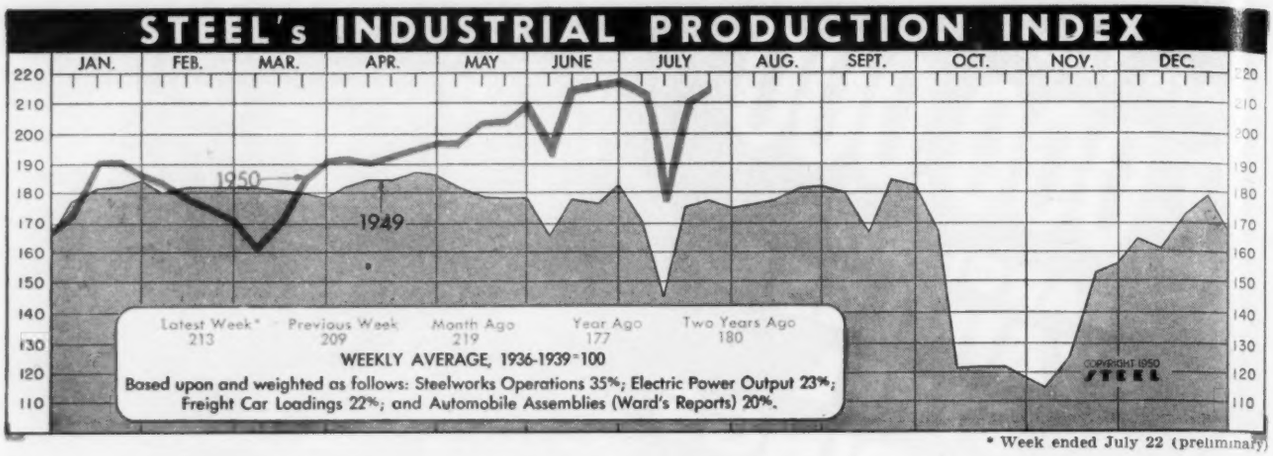
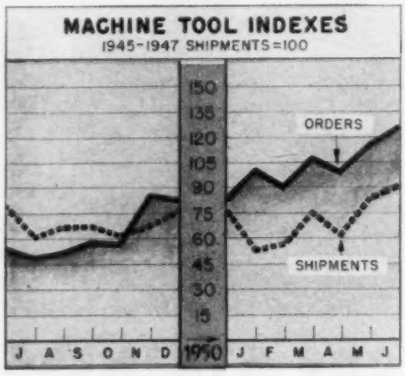

STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1950
1949
Latest Week* 213
Previous Week 209
Month Ago 219
Year Ago 177
Two Years Ago 180
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1950 STEEL

* Week ended July 22 (preliminary)

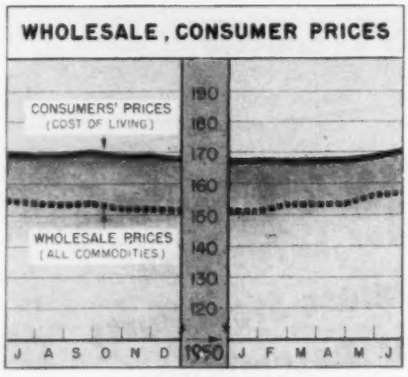
Charts—Copyright 1950, STEEL



Machine Tool Indexes

	New Orders		Shipments	
	1950	1949	1950	1949
Jan.	99.7	87.0	52.4	68.8
Feb.	89.2	80.9	56.1	70.3
Mar.	107.4	93.5	75.3	75.8
Apr.	98.9	70.1	61.6	74.7
May	116.4	63.7	82.5	72.8
June	126.2	53.6	90.4	79.0
July	...	48.0	...	60.7
Aug.	...	51.5	...	67.3
Sept.	...	57.7	...	67.6
Oct.	...	56.8	...	62.3
Nov.	...	84.3	...	67.6
Dec.	...	82.5	...	75.7

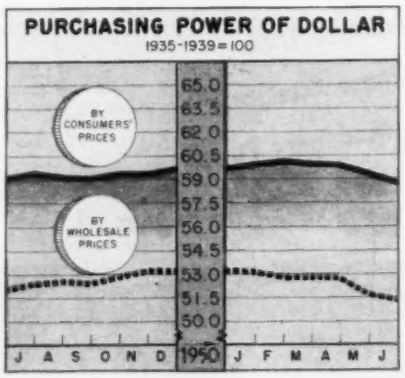
National Machine Tool Builders' Assoc.



Price Indexes

	Wholesale		Consumers	
	1950	1949	1950	1949
Jan.	151.6	160.5	166.9	170.9
Feb.	152.7	158.1	166.5	169.0
Mar.	152.6	158.4	167.0	169.5
Apr.	152.9	156.9	167.3	169.7
May	155.9	155.7	168.6	169.2
June	157.3	154.4	170.2	169.6
July	....	153.4	....	168.5
Aug.	....	153.0	....	168.8
Sept.	....	153.6	....	169.6
Oct.	....	152.2	....	168.5
Nov.	....	151.6	....	168.6
Dec.	....	151.3	....	167.5
Average	....	154.9	....	169.1

Bureau of Labor Statistics



Purchasing Power of the Dollar

As Measured by:

	Wholesale Prices		Consumers' Prices	
	1950	1949	1950	1949
Jan.	53.1	50.1	59.9	58.5
Feb.	52.7	50.9	60.1	59.2
Mar.	52.7	50.8	59.9	59.0
Apr.	52.7	51.2	59.8	58.9
May	51.7	51.6	59.3	59.1
June	51.3	52.0	56.7	59.0
July	...	52.4	...	59.3
Aug.	...	52.6	...	59.2
Sept.	...	52.4	...	59.0
Oct.	...	52.8	...	59.3
Nov.	...	53.2	...	59.3
Dec.	...	53.2	...	59.7

U. S. Office of Business Economics

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction July24	Furnaces, W. Air..May8	Ranges, Gas. July10
Durable Goods July24	Gear Sales July10	Steel Cast. July24
Employ., Metalwkg.June19	Gray Iron June5	Steel Forgings June5
Employ, Steel July24	Indus. Prod. July10	Steel Shipments ...July24
Fab. Struc. Steel...July17	Ironers July17	Trucks, Elec. Ind...Jan.2
Foundry Equip. July10	Malleable Cast. July24	Wages, Metalwkg...June19
Freight Cars July17	Pump Orders July17	Washers July10
Furnaces, Indus. ..July17	Radio, TV July17	Water Heaters July10

Tool Buying at 5-Year High

June's machine tool orders index was at the highest rate since May, 1945. The National Machine Tool Builders' Association index rose to 126.2 in June from 116.4 one month earlier. Replacement buying by industry carried all tool builders up to the latest mark, but earlier in the year much of the improvement was concentrated in special tools. Standard items are in stronger demand now than they have been since the end of World War II.

Shipments in June also rose but not as much as orders. The shipments index was 90.4, highest point since December, 1948. In May it was 82.5 and in June, 1949, it was 79. Ratio of unfilled orders to shipments declined to 5.1 to 1 in June from 5.2 to 1 a month earlier because of the large rise in shipments.

Association indexes are based on average monthly shipments in 1945-1947 equaling 100. Average annual shipments in the base period were $355 million.

It's Costing More To Live

Even before war-scare buying began to push prices up, the Bureau of Labor Statistics consumers' price index made its biggest advance in 18 months during the period between May 15 and June 15. On the later date it stood at 170.2 per cent of the 1935-1939 average, 0.9 per cent higher than the 168.6 recorded a month earlier. Another big jump is expected in the index for the month ended July 15 when the figures are released in late August.

Percentagewise the bureau's wholesale price index for June made the same gain as the consumers' index. A 0.9 per cent gain brought the wholesale index up to 157.3 per cent of the 1926 average. Foods, metals and building materials advanced 1.4, 1.2 and 2.1 per cent, respectively.

The Business Trend

Today's shortages are just a taste of what may be in store for metalworking companies as the nation rearms. Civilian output continues at high levels

DEFENSE orders soon will make their presence felt in metalworking. Materials shortages of today will be mild in comparison with what is to come in an accelerating rearming program.

All production gages show output in civilian hard goods is still at lofty levels but shortages in labor as well as materials are not far away.

Metalworking lines engaged in turning out products for home construction may be cutting their output as tighter credit reduces the number of home buyers.

Higher taxes taking some profit out of operations are a foregone conclusion. An excess profits tax on corporations at least as tough as during the World War II years will trim the net on goods manufactured and a higher tax rate on consumers will reduce buying power for the items that are available.

In the week ended July 22 STEEL's industrial production index moved 4 points higher than the revised index for the preceding week to a preliminary 213 per cent of the 1936-1939 average. This production figure was attained despite some plants being closed for vacations. In the like week a year ago the index was 177.

Steelmaking . . .

Output in the steel mills was virtually unchanged from the week ended July 22 when the rate was 99 per cent of theoretical capacity. Consumers are not getting all the steel they need despite near capacity operations.

Automobiles . . .

Automakers, biggest steel consumers, now are scrambling for steel and expect the situation to get worse. Nonferrous metals too are a source of grave concern. There is a growing conviction that the 6.6 passenger car total projected for U. S. plants will not be reached even if government controls are not imposed. Dealer stocks are down and order backlogs are high but the aforementioned metals shortages are expected to hinder the drive toward new marks. Truck output, already high, will get another boost when the military use increased appropriations to place more truck orders.

Carloading . . .

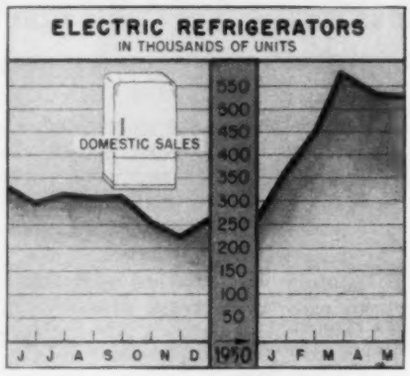
Heavy loadings of coal, iron ore and miscellaneous merchandise set the pace as freight carloadings rebounded to 789,268 cars in the week ended July 15 from 553,876 in the preceding week. Loadings in the latest week reported exceeded the 1949 total by 9 per cent but were 11.5 per cent below the comparable week in 1948.

Employment . . .

Factory employment rose to more than 14.6 million in June says the Labor Department. The number employed in factories is 250,000 above May and 800,000 over June, 1949. Marked gains over the previous month were reported in stone, clay and glass; primary metals; fabricated metals; electrical machinery; and machinery except electric. Durable goods

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capactiy)†	99.0	96.0	101.5	77.0
	Electric Power Distributed (million kilowatt hours)	6,186	6,006	6,102	5,461
	Bituminous Coal Production (daily av.—1000 tons)	1,550	250	1,752	1,151
	Petroleum Production (daily av.—1000 bbl)	5,537	5,495	5,355	4,739
	Construction Volume (ENR—Unit $1,000,000)	$343.3	$365.0	$256.2	$158.8
	Automobile and Truck Output (Ward's number units)	190,615	194,073	205,334	160,173
	* Dates on request. † 1950 weekly capacity is 1,906,267 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (unit—1000 cars)	785†	789	811	719
	Business Failures (Dun & Bradstreet, number)	170	187	147	182
	Money in Circulation (in millions of dollars)‡	$27,029	$27,169	$26,926	$27,366
	Department Store Sales (changes from like wk. a yr. ago)‡	+24%	+8%	+6%	−10%
	† Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,106	$14,372	$15,885	$13,182
	Federal Gross Debt (billions)	$257.2	$257.2	$256.3	$252.9
	Bond Volume, NYSE (millions)	$28.9	$29.9	$16.3	$22.9
	Stocks Sales, NYSE (thousands of shares)	11,744	12,961	8,046	5,286
	Loans and Investments (billions)†	$67.6	$67.7	$67.3	$62.9
	United States Gov't. Obligations Held (millions)†	$36,248	$36,152	$36,505	$35,254
	† Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.69	156.69	156.58	152.80
	STEEL's Nonferrous Metal Price Index‡	192.1	190.1	182.7	175.9
	All Commodities†	162.9	161.9	157.1	154.0
	Metals and Metal Products†	173.3	173.1	173.0	167.8
	† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100. †† 1935-1939=100.				

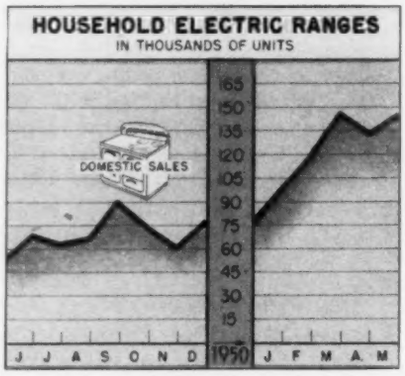


Electric Refrigerators

Domestic Sales—Units

	1950	1949	1948
Jan.	364,002	380,853	272,121
Feb.	450,751	337,424	281,580
Mar.	572,691	369,216	338,109
Apr.	531,498	324,370	330,720
May	528,506	330,753	317,763
June	.....	296,199	373,115
July	.....	315,444	351,094
Aug.	.....	307,622	281,345
Sept.	.....	309,429	344,260
Oct.	.....	252,580	380,854
Nov.	.....	221,221	374,470
Dec.	.....	259,158	330,660

National Electrical Mfrs. Assoc.

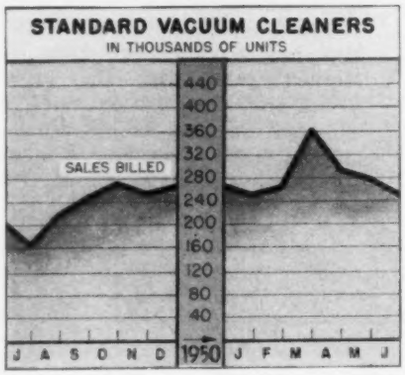


Household Electric Ranges

Domestic Sales—Units

	1950	1949	1948
Jan.	97,925	106,473	103,585
Feb.	118,989	87,370	103,506
Mar.	145,417	87,543	127,461
Apr.	132,859	59,894	104,677
May	144,093	52,286	98,983
June	.....	68,107	123,300
July	.....	62,402	83,485
Aug.	.....	66,222	116,107
Sept.	.....	91,073	128,829
Oct.	.....	72,672	122,516
Nov.	.....	60,523	123,661
Dec.	.....	77,011	105,387
Total	.....	903,806	1,341,497

National Electrical Mfrs. Assoc.



Standard Vacuum Cleaners

Sales Billed—Units

	1950	1949	1948
Jan.	249,150	228,769	304,273
Feb.	263,515	241,267	311,448
Mar.	361,014	309,897	355,415
Apr.	292,664	252,656	306,588
May	278,645	222,850	276,657
June	250,190	207,354	256,071
July	.....	161,920	229,537
Aug.	.....	219,909	237,202
Sept.	.....	250,036	280,084
Oct.	.....	272,520	281,573
Nov.	.....	253,516	255,080
Dec.	.....	265,513	273,890
Total	.....	2,886,514	3,360,859

Vacuum Cleaner Manufacturers Assoc.

Charts—Copyright, 1950, STEEL

industries accounted for most of the employment rise in the first half. The first substantial rise this year in nondurable industries occurred between May and June when nearly 80,000 were added to payrolls. Seasonal hiring of 50,000 workers in the food group accounted for most of the rise but nearly all other nondurables showed modest gains.

Heavy Engineering . . .

If engineering construction contracts at the end of July hold near the pace attained earlier in the month another monthly record will be set. Contracts totaled $343.3 million in the week ended July 20, below the $365 million peacetime record attained the preceding week but far above the weekly average for this year. July's weekly average moved up to $307 million on the strength of the latest two weeks reported, 23 per cent above the record high $250 million per week average attained in June. Total volume for the first 29 weeks this year is $6588 million and is 49 per cent above last year. Private construction at $3813 million is 85 per cent over a year ago. Public awards are up 17 per cent.

Truckloading . . .

Motor carriers' freight volume in May increased 11.1 per cent over April and 31 per cent over May, 1949. American Trucking Associations reports these carriers transported 3,929,766 tons in May. Carriers of iron and steel hauled about 6 per cent of total tonnage.

War Brought Home

President's order to curb inflation, conserve materials will give homebuilding a sedative

RIGHT AFTER homebuilding was given a shot in the arm by GI home loan regulations that went into effect a few weeks ago and another fillip was promised by the small homes program under the Federal Housing Administration, the impact of the Korean conflict on the nation's economy was brought home literally and in full force. It started a chain reaction that went like this:

The president requested the use of controls to conserve building materials to curb inflation. Later he asked for further controls to conserve building materials for national defense.

Close the Door, Richards—Federal Housing Commissioner Franklin D. Richards announced credit restrictions under FHA insured loans. In a telegram to FHA field offices he issued these instructions: Cash down payment of 10 per cent shall be required on property improvement loans under Title I. Eligibility provisions of administrative rules under all mortgage insurance plans are amended by reducing the ratios of loan to value or loan to cost specified therein by 5 per cent of the value or the cost. Construction figures used in insuring offices to analyze property for mortgage insurance or yield insurance shall be frozen as of July 1, 1950. Dollar mortgage limitation on single family dwelling is reduced from $16,000 to $14,000. Military housing and housing in Alaska were expressly exempted from new FHA controls.

More Yet—Carl R. Gray Jr., administrator of veterans affairs, also put into effect the President's request to moderate government supports for GI housing credit. Like Mr. Richards, Mr. Gray also increased down payment requirements and froze cost factors so veterans might still get something of a preference in buying homes.

13 Million Prospects—What would it mean? A good many of the 13 million veterans who did not use GI Bill benefits to buy or build a home up to this time might have to wait a while longer. And, the FHA small homes program might be knocked into a cocked hat. Last year more than a third of the new home buyers using FHA-insured financing were families with incomes of less than $300 monthly. They bought houses with an average FHA evaluation of about $7000 and their monthly mort-

gage payments ran around $50 a month.

Two Booms—Real estate men who heard the Korean war out-thundering their own booming business saw the handwriting on the wall: Credit restrictions would strike them hard. Early last week they were recalling the services they performed for the government during the last war: Location of air fields and synthetic rubber plants, assembly of land for cantonments, hospital sites, naval bases and entire new towns for war workers. Their agency, the National Association of Real Estate Boards, pledged its aid and co-operation to the government in the real property problems it might come up against if there was an allout war.

Helicopters Soar to High

Helicopter sales soared to a new high for Hiller Helicopters in the first half, says Stanley Hiller Jr., president. They were 100 per cent higher than in 1949. Since the company's first commercial delivery 17 months ago, Hiller 360 Helicopters have gone to nearly all parts of the world in addition to widespread domestic sales.

Growing list of buyers includes both the Army and Navy, European, Latin American and Asiatic governments. A new market development and merchandising program is now operating through the company's world wide distributor organization.

More Bay Area Spending

Increased employment and overall active business conditions are bringing a steady rise in consumer spending in the San Francisco area.

A survey by the Bay Area Council shows taxable retail sales in the nine counties of the area totaled $692.5 million in the first quarter this year compared with $687.7 million in the similar period a year ago. One of the biggest gains was in auto sales; new and used car dealers reported an increase of $23.4 million this year compared with last. Expanding home building was reflected in a $3.6 million increase in home appliance sales and a $5.3 million gain in home furnishings.

Vacuum Cleaners Sweep to Lead

Vacuum cleaners factory sales in the first half swept to a commanding lead over year ago figures. In the first six months sales aggregrated 1,695,178 units or 15.8 per cent more than the like 1949 total of 1,463,100, says Vacuum Manufacturer's Association.

June sales were 20.6 per cent higher than the like month a year ago, totaling 250,190 as compared with 207,354 in the earlier period. Sales in June were down 10.2 per cent from the May total.

Monarch Backlog Triples

An appreciable increase in business volume in recent months resulting in a backlog three times what it was at the start of the year is reported by Jerome A. Raterman, president, Monarch Machine Tool Co., Sidney, O. The company added more men to its working force and believes the rest of 1950 holds good promise.

Net earnings rose to $113,384 in the second quarter from $101,732 in the first quarter. Net earnings per share in the first half were $1.02. A year ago they were $1.33.

Business Worth $30 Billion

American highway transportation is a $30 billion annual business says E. D. Bransome, president, Mack Trucks Inc., New York. He defines highway transportation as both motor vehicles and highways and says it is the transportation system that made our national progress possible. This $30 billion network includes, busses, passenger cars, trucks, truck trailers on rural roads, city streets, truck highways and the companies that supply or service these, Mr. Bransome adds.

Ferro's Sales, Earnings at Peak

Ferro Enamel Corp.'s earnings in the first half broke all records for sales and profits, says Robert A. Weaver, chairman of the Cleveland company. The unaudited consolidated net profit for the period amounts to $2.70 a share, compared with $1.24 in the corresponding 1949 period. This indicates earnings are about $1,127,000. In the first half last year they were $515,152.

Mr. Weaver states that unless steel for Ferro's customers is drastically curtailed earnings in the second half should be satisfactory.

Building Costs Mount

Rising wage scales and materials costs push construction index near record levels

IF you are going to build or expand your plant, it's going to take more money. The dollar spent for construction will do only 42 per cent the work it did during the predepression building boom and only 70 per cent as much as in November, 1946, when prices were decontrolled (see chart). Construction cost figures are based on American Appraisal Co.'s construction cost index which uses 1913 costs as a base.

In June the index reached 498, only 6 points below the alltime high recorded in October, 1948, and 15 points above the December, 1949, level.

Extras Are Extra—Even this figure does not tell the whole story. It is based on average costs under normal conditions with no allowance for overtime, bonuses paid in order to get certain kinds of skilled help, premiums on materials or special conditions. One or more of these factors will enter into your building cost to push your outlay for that new addition even higher.

American Appraisal Co.'s index moved up 3 points in January over December due to increased materials costs including structural steel, reinforcing rods and certain lumber items. Labor costs went up because of higher social security payments at the start of the year.

After the January rise the index remained stationary for the rest of the first quarter with higher labor efficiency wiping out some nominal price increases.

Going Up—In the second quarter 2 point gains were registered in both April and May. June's advance totaled 8 points. Increases in lumber prices and building trade wage rates as well as a rise in brick and cement prices in certain localities all contributed to the advance. Not shown in the index are the premium payments for skilled trades in short supply that became increasingly common in the three months covered in the latest report.

Construction Dollars Buying Less and Less

. . . premiums for skilled trades are an additional burden

* Based on costs in November, 1946, when prices were decontrolled.

Men of Industry

JACK P. PEDERSEN
. . . Clinton Machine, Warner Div. gen. mgr.

Jack P. Pedersen was appointed general manager, **Warner Division,** Clinton Machine Co., Detroit, which was formerly the Warner Aircraft Corp. For the last two years he has been associated with Powell Crosley Jr., and before that was regional manager in the Detroit area for Scintilla Magneto Division, Bendix Aviation Corp. **Col. Oliver Gardner** was named assistant to the president, and **Clarence A. Sherman** is Warner's new chief engineer. Mr. Sherman was in charge of development and designing of aircraft hydraulic valves and systems for Vickers Inc.

Gordon F. Seely was appointed field engineer, **Chicago Pneumatic Hydraulic Tool Division,** Chicago Pneumatic Tool Co., New York. At present he is working out of the company's Detroit plant.

Clayton E. Scholes was appointed sales manager, **Edgar T. Ward,** Cleveland division of Solar Steel Corp.

Champion Rivet Co., Cleveland, appointed **T. J. Dempsey Jr.** as district manager of the Pittsburgh area. He formerly was connected with National Bearing Division, American Brake Shoe Co.

William O. Murphy was appointed sales manager, materials handling equipment division, **Union Steel Products Co.,** Albion, Mich. He formerly was associated with Byrne Doors Inc., Truscon Laboratories and Detroit Edison Co. He succeeds **L. F. Emigholz** who resigned to become assistant to the president of Williams Form Engineering, Grand Rapids, Mich.

BOB KIRKMAN
. . . manager, Strand Garage Door Division

Bob Kirkman was named manager, **Strand Garage Door Division,** Detroit Steel Products Co., Detroit. For some time Mr. Kirkman has been representing the Strand division in the southwest area, and prior to that was with Hunter Fan & Ventilating Co., Memphis, Tenn.

Cleveland-Cliffs Iron Co., Cleveland, appointed **W. A. Sterling** a vice president. He has been serving as manager of its Mesabi range properties. In his new posiiton, with offices in Cleveland, he will direct the company's mining operations. **C. W. Allen** was appointed general manager of iron ore operations on both the Marquette and Mesabi ranges under Mr. Sterling's direction. **C. J. Stakel,** presently general manager, iron ore operations, is retiring from that position but will continue in a consulting capacity. Succeeding Mr. Sterling as manager, Mesabi range properties, will be **Grover J. Holt,** chief engineer.

Don V. Sawhill was elected to the board of directors, **Copperweld Steel Co.,** Glassport, Pa. Mr. Sawhill is also president and director of Mercer Tube & Mfg. Co., Mercer Steel Products Co., Sawhill Mfg. Co. and Shenango Tube Co., all of Sharon, Pa., and Agaloy Tubing Co., Springfield, O.

Homer E. Rieker was appointed manager, tubular products department, Cleveland, **Joseph T. Ryerson & Son Inc.** He succeeds **Allen P. Beckloff,** promoted to divisional manager, tubular products, with headquarters at the Ryerson plant in Chicago. Before joining Ryerson Mr. Rieker was branch manager, Kalamazoo Stove & Furnace Co., in eastern Pennsylvania.

EVERETT M. HICKS
. . . grinding machine div. mgr. at Norton

Everett M. Hicks was appointed manager, grinding machine division, **Norton Co.,** Worcester, Mass. **Walter G. Johnson** was named manager of research and engineering of the division. Mr. Hicks, who has been assistant manager of the division since 1947, assumes the managerial duties of **Frank W. Smith,** vice president and former manager, so that the latter can devote full time to policy making duties as vice president in charge of the grinding machine division. **Irwin W. Peterson** was appointed salesman in the Detroit area for the division. **Albert G. Belden** retired July 1 as manager of the division's research and engineering.

William L. Wagner was named assistant to the director of purchases in charge of steel, **Willys-Overland Motors Inc.,** Toledo, O. Since 1947 he has held a similar position with Dura Division of Detroit Harvester Co. **Gordon S. Yost** was named purchasing agent in charge of chassis parts, electrical equipment, tires and tubes, replacing **G. R. Cheetham,** resigned. **Gaylord N. McSherry** succeeds Mr. Yost as assistant purchasing agent. **Fred H. Klein** was named assistant purchasing agent, body stamping section.

Eugene N. Lohre, assistant to the vice president-sales, was named district manager of the Chicago sales office, **Jessop Steel Co.** Previous to 1948 he was with Carnegie-Illinois Steel Corp.

Vincent T. Lombardy was appointed assistant district manager, Newark, N. J., for **United States Steel Supply Co.,** subsidiary, U. S. Steel Corp. He

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succeeds **William R. Holmes,** appointed Baltimore district manager.

George H. McBride was appointed manager, gearing division, **Westinghouse Electric Corp.,** Pittsburgh, succeeding **L. R. Botsai,** now manager of Westinghouse's plant in Buffalo.

Dr. John T. Rettaliata, dean of engineering at Illinois Institute of Technology, was named vice president of the **American Society of Mechanical Engineers.**

Tom King has joined the sales staff of **Harley-Davidson Motor Co.,** Milwaukee, and will serve dealers in New York, part of northern Pennsylvania and provinces of Ontario and Quebec.

Charles O. Cornell, controller, Buffalo Bolt Co. since 1944, was named vice president of finance by the company which has changed its name to **Buffalo-Eclipse Corp.,** Buffalo.

Dr. Max T. Goebel, assistant technical director, **Grasselli Chemicals Department,** E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., was appointed technical director succeeding **Dr. John C. Woodhouse,** who has undertaken a special assignment with the company.

William A. Burns Jr. was appointed vice president and general sales manager, **Trailmobile Co.,** Cincinnati.

American Steel & Wire Co., Cleveland, subsidiary, U. S. Steel Corp., announces personnel changes at its Cleveland plants: **Harry O. Johnson** was assigned to special duties in the office of vice president-operations, and is succeeded by **John E. Allen** as general superintendent, central furnaces and docks, and the Cleveland coke works. **George March** was appointed to succeed Mr. Allen as works superintendent, central furnaces and docks.

Malcolm L. Hall was appointed manager, testing equipment department, **Baldwin Locomotive Works,** Eddystone, Pa. He was sales manager of the department.

Luria Bros. & Co., St. Louis, announces that **Jack R. Forcheimer** and son, **Charles M. Forcheimer,** are now associated with the company. They formerly were partners in their own firm of Jack R. Forcheimer & Son.

Phil H. Richey was appointed personnel director of **Detrex Corp.,** Detroit.

Nils Walter Swenson was appointed assistant manager of branch sales, mechanical goods division, **United States Rubber Co.,** New York. He formerly was manager, mechanical goods sales, at Buffalo.

Dearborn Chemical Co., Chicago, appointed **Lester R. Sagar** as process manager. He will supervise production planning and development of process equipment.

Willard R. Barrett, formerly vice president and general manager, Hoosier Cardinal Corp., Evansville, Ind., was named sales manager, plastics division, **General Electric Co.,** at Pittsfield, Mass. **Jack Hause** was appointed manager, transportation division at GE's St. Louis office, headquarters of the apparatus department's newly formed mid-states district. **Thorn L. Mayes** was appointed manager, Lynn, Mass., motor engineering division, small and medium motor divisions; **Ralph E. Donnelly,** assistant manager, Fitchburg, Mass., turbine sales division; **William E. Herrmann,** manager of sales, laboratory products section, special products division, replacing **Robert K. Person,** transferred to the staff of the manager of manufacturing, large apparatus divisions. **Dwight E. Moorhead** was appointed manager, San Jose, Calif., motor divisions, small and medium motor divisions; and **Gerald E. Green,** motor specialist, apparatus department, San Francisco.

Richard A. Weppner was appointed sales engineer for corrosion-resistant chemical and construction materials in Delaware, Maryland, Virginia and parts of New Jersey. **William A. Sey** for **Atlas Mineral Products Co. Philip E. Berens** was appointed sales representative for the corrosion-resistant materials in eastern Pennsylvania, western New York, and parts of New Jersey. **William A. Streaker** was appointed sales engineer for corrosion-proof materials in the lower peninsula of Michigan, eastern Indiana and Lucas county in Ohio.

Ernest G. Jarvis was elected to the board of directors, **American Crucible Co.** in North Haven, Conn. Mr. Jarvis is president, Continental Copper & Steel Industries Inc., New York.

Thomas N. Parlon was appointed sales manager, New York regional office, Philadelphia division, **Yale & Towne Mfg. Co.** He joined the company in 1945 as associate director of field activities.

L. J. Brady was named manager, St. Louis district, replacement tire sales division, **B. F. Goodrich Co.,** Akron. **John R. Watkins** was named operating manager of International B. F. Goodrich Co., a division of the parent corporation.

John P. Conde was appointed advertising and sales promotion manager, **Brady-Milwaukee Co.,** a division of W. H. Brady Co., Chippewa Falls, Wis. Mr. Conde previously was advertising manager, Askania Regulator Co., Chicago.

Blaw-Knox Construction Co., chemical plants division, Pittsburgh, appointed **Dr. H. Roswell Jones** to its synthetic fuels and chemicals department.

Charles C. O'Neal has retired from the sales department of **Carnegie-Illinois Steel Corp.,** subsidiary, U. S. Steel Corp., Pittsburgh, after 48 years of continuous service with this

HARRY O. JOHNSON
. . . assigned to special duties, AS&W

JOHN E. ALLEN
. . . gen. supt. of two plants at AS&W

LEONARD J. MAGUIRE
. . . works mgr., Fairbanks, Morse scale plant

KENNETH R. BEARDSLEE
. . . new president at Carboloy

EUGENE F. WAMBOLD
. . . exec. V. P. at Carboloy

and other subsidiary companies of the corporation.

Leonard J. Maguire was appointed works manager, **Fairbanks, Morse & Co.'s** scale plant located in St. Johnsbury, Vt. Since 1929 Mr. Maguire has held various positions in the scale division, both in the factory and in sales. In 1948 he was made chief engineer of the plant.

Robert J. Runge was appointed sales promotion manager for **Thor Corp.,** Chicago. He succeeds **Emil G. Best,** recently promoted to advertising manager. Prior to joining Thor, Mr. Runge directed sales promotion for the plumbing and heating division of Crane Co.

Kenneth R. Beardslee, formerly vice president and marketing manager, **Carboloy Co. Inc.,** Detroit, was named president of the company to succeed the late **Walter G. Robbins. Eugene F. Wambold,** formerly vice president in charge of manufacturing, was named to the newly created post of executive vice president in charge of manufacturing, engineering, employee and community relations, and purchasing.

Charles S. Peet was appointed to the staff of **Battelle Memorial Institute,** Columbus, O. He will be engaged in research on engineering properties of materials.

S. C. Commander was appointed cable representative for **Reynolds Metals Co.,** Louisville. He will cover Texas, and maintain his office in Dallas.

William M. Bergemann was appointed director of purchases, **Falk Corp.,** Milwaukee. He has been assistant to the works manager. **Howard Larsen** was named purchasing agent to replace **Thomas I. Scanlan,** retired.

Standard Transformer Co., Warren, O., appointed **E. C. Fones Jr.** as its exclusive representative for North and South Carolina.

Norman F. Tisdale Jr. becomes associated with **Molybdenum Corp. of America,** Pittsburgh, as a development engineer, Aug. 1.

OBITUARIES . . .

Louis T. Shorley, 59, president and treasurer, **Freyn Engineering Co.,** Chicago, died July 20.

Elbert D. Holt, 46, a chemist and metallurgist for **Precision Scientific Co.,** Chicago, died July 20.

Arden W. LeFevre, vice president-engineering, **Stewart Warner Corp.,** Chicago, died July 22.

John W. Johnson, 55, research engineer for **Ferro Enamel Corp.,** Cleveland, died July 24 following a heart attack suffered while at work.

Henry L. Hopkins, 59, sales manager, Fabricoid department, fabrics and finishes department, **E. I. du Pont de Nemours & Co. Inc.,** Wilmington, Del., died July 13 in Starke, Fla., of a heart attack.

Smith F. Ferguson, 77, retired engineer and clock executive, died at his summer home in Camden, Me., July 21. He was associated with **Seth Thomas Clock Co.** which later was absorbed by General Time Instruments Corp., New York. He retired about three years ago.

Richard Humpole, 45, assistant to the manager, pig iron product sales department, **Inland Steel Co.,** Chicago, died July 19.

Richard R. Reaume, 77, treasurer of **Cyclone Fence Co.,** Holly, Mich., before its acquisition by American Steel & Wire Co., died July 19. He retired from Cyclone in 1940 as sales correspondent in North Chicago, Ill., after 38 years' association with the company.

Douglas C. Carruthers, general manager of **Pittsburgh Plate Glass Co.'s** paint plant, Springdale, Pa., died July 14.

Louis Weidlich, 74, president and treasurer, **Weidlich Bros.,** Bridgeport, Conn., silver products manufacturer, which he established 50 years ago, died in Fairfield, Conn., July 21.

William H. Staring, 74, chairman of the board of **Automatic Voting Machine Co.,** Jamestown, N. Y., died of a heart attack July 21.

Staunton B. Peck, 85, a former vice president and director, **Link-Belt Co.,** Chicago, died July 15 at his home in Philadelphia.

Thomas R. James, 76, a retired master mechanic for **Wisconsin Steel Co.,** Chicago, died July 20.

David C. Griese, former chairman of the board, **National Screw & Mfg. Co.,** Cleveland, died July 21.

George F. Lord, 76, a former director of advertising, **E. I. du Pont de Nemours & Co. Inc.,** Wilmington, Del., died July 14.

Ralph J. Hoensheid, 51, president and founder, **Commercial Steel Treating Corp.,** Detroit, died July 21.

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Production AND Engineering NEWS AT A GLANCE

SPACE LIMITATION NO PROBLEM—Laboratory development of a tiny, inexpensive photocell, thinner than a match stick and less than 1 inch long, for operating relays is reported by Sylvania Electric Products Inc. The company states the new subminiature device is so sensitive that current changes are obtained with relatively small changes in light intensity. Development, which uses the photosensitivity of germanium, is expected to find wide use in electronic computing and sorting devices and in opening and closing doors. Its compactness makes it particularly well suited in applications where cost, complexity of circuitry and space limitations are important factors.

LOTTA HOT VAPOR—Vacuum system employed in the Navy's newest high-altitude test chamber for researching on large-scale ramjet engines at simulated altitudes of 100,000 feet and four times the speed of sound requires plenty of steam. Amount of steam used is enough to supply electricity for a city of 100,000 persons. The system combines steam-jet ejectors with turbo blowers to obtain maximum capacity from a steam supply of 270,000 pounds per hour at a pressure of 400 pounds per square inch. The test chamber used at the service's Ordnance Aerophysics lab in Daingerfield, Texas, is 10 feet in diameter and 125 feet in length with a door in its side 30 feet long, through which the "stovepipe" engines are installed for test.

PACKS PLENTY OF MUSCLE— A new zinc alloy which has about eight times the useful strength of any similar alloy now in use is reported by Illinois Institute of Technology, Chicago. Composed principally of zinc, with small quantities of copper and beryllium added, the alloy has about the same strength as brass, and is said to be less expensive.

NOW—DUCTILE VANADIUM—Westinghouse researchers have come up with a new process for making powdery fine vanadium which makes possible for the first time the production of this metal in any shape or size. The powdered metal produced by the method is scarcely more coarse than fine talcum powder. Processs consists essentially of reducing the starting product of vanadium pentoxide to the trioxide by reaction with hydrogen, then completing the reduction with metallic calcium and calcium chloride. The product is pure vanadium which can be formed into ductile wire or sheet by conventional powder metallurgy and rolling operations. Relative importance of this new process is as yet difficult to evaluate. Vanadium is an abundant element, ranking eighth among structural metals. Due to its excellent physical properties, it will likely prove valuable as an alloying agent. Alloyed with increasingly common titanium and zirconium, it makes possible hardening of these metals by heat treatment.

NO NOISY TEETH—Through its Al-Fin process of molecularly bonding aluminum to steel, the Al-Fin Division of Fairchild Engine & Airplane Corp., Farmingdale, L. I., has come up with a new gear which is as quiet in operation as the composition type. It is made of aluminum alloy with a bonded-in steel hub. The company reports that with the steel hubs there is no danger of the aluminum gear conforming to the shaft. The gear has a tensile strength of about 15,000 pounds per square inch, and has withstood shear tests of the bond up to 98,000 pounds.

"SUPER MACHINING" STEELS—It looks as if the newly developed "super machining" steels were created just in time. With war clouds darkening the nation's skies, these steels may go a long way in helping increase production through their improved machinability and fabricating characteristics. They provide much longer tool life and help increase production up to 100 per cent or better. Sufficient tests have now been made so that a clear picture can be provided anyone attempting to fit these steels into their operations. (p. 60)

CHANGE-OVER WITH KICK — By making a simple substitution — replacing one machine tool by another —production rate of 15-tooth ratchets at Buick was stepped up to 130 per hour. The tooth cutting machine currently employed cuts all 15 teeth simultaneously on stacks of four arbor-mounted blanks. Under the old setup, the production rate was only 12 pieces per hour. The new machine processes some 1200 ratchets before regrinding is necessary. (p.63)

HIGH SPEED DRAWING — Steel, brass, copper and other nonferrous rods of round, hexagon, square or rectangular sections now can be processed direct from coiled stock at a rate of 250 feet per minute by a novel drawbench developed by Loma Machine Mfg. Co., New York. Stock in the unit is pulled through the die at uniform speed. The gripping tool never requires changing regardless of the size and shape of the stock. (p. 65)

ACID SALVAGING PAYS—Steel industries faced with the problem of disposing of huge quantities of waste pickle solutions containing iron sulphate and free sulphuric acid may profit from a new process for salvaging spent pickling acid. The method enables acid left in the bath to be concentrated for further use at the same time filtering out iron sulphate either for dumping or for use in the production of iron oxide. Process also can be used profitably in the titanium pigment industry. (p. 68)

"Super Machining" Steels Increase Production 100%

Automatic screw machine shops report excellent performance for the improved free-machining bessemer and lead bearing rephosphorized and resulphurized open hearth steels. Much longer tool life, reduced down time, higher cutting speeds and feeds, increased operating efficiencies are some of the advantages users are exploiting

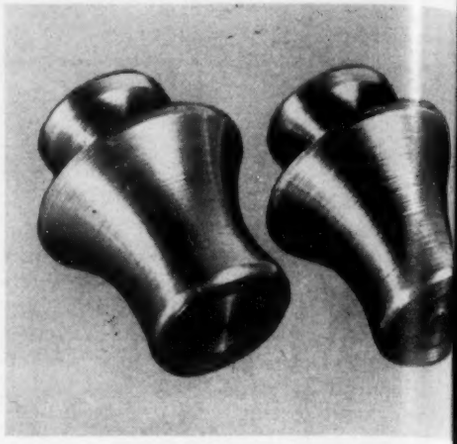


Fig. 1—Screw machine part at left, made from MX B-1113 steel, has superior finish, compared with one at right, made from B-1113 steel. Gain in production time is over 30 per cent

BY E. F. ROSS
Chicago Engineering Editor, STEEL

SPECTACULAR improvements in machinability and fabricating characteristics of the free-machining class of steels are creating a surge of interest in the competitive, highly cost-conscious metalworking industry. So new and far-reaching are some of these developments that only lately has it been possible to appraise their true worth. Sufficient testing now has been performed and experience in use assembled to provide a clear picture to those who thus far have not tried to fit these steels into their operations.

Frequently referred to as "super machining" screw stock steels, these materials are of two general types —improved free-machining bessemer steels and lead bearing rephosphorized and resulphurized open-hearth steel.

New Steels Announced—Several steel manufacturers within the past year have announced new steels of the first general type. One is MX steel by Carnegie-Illinois Steel Corp., Pittsburgh, another is E steel by Jones & Laughlin Steel Corp., Pittsburgh. Republic Steel Corp., Cleveland, is also making B-1111-X, B-1112-X and B-1113-X steels. The lead-bearing open-hearth steel is an improved grade of Ledloy which Inland Steel Co., Chicago, introduced in 1938.

Conventional bessemer screw steel, B-1113, analyzes: Carbon, 0.13 max.; manganese, 0.70-1.00; phosphorus, 0.07-0.12; and sulphur, 0.24-0.33 per cent. Both MX and E steels conform to AISI and SAE B-1113 compositions. The difference is that their carbon contents average consistently lower than that of regular B-1113 steel as normally produced, MX being held to 0.08 maximum and E to 0.06 maximum carbon, as compared with 0.09 minimum for regular B-1113.

MX steel (U. S. Patent 2,485,358) is a free-machining bessemer product which is demonstrating outstanding performance in automatic screw machines. It is readily forgeable, has good ductility and responds well to cold working.

Melting Procedures Set Properties—Its attributes are said to be derived from melting procedures and close control of the bessemer converter. The company makes use of the spectroscope for accurate and consistent determination of the end of the blow. Considered responsible for the excellent machinability of MX are the percentages of carbon, silicon and manganese, and nature of the sulphide inclusions in the steel.

MX is made to a maximum of 0.08 per cent. The range usually is 0.06-0.07 per cent. With this low carbon, amount of silicon is of prime importance, thus melting practice is established on the basis of limiting this element to less than 0.01 per cent. Manganese is held within the range of 0.70 to 1.00 per cent. This increases production costs because large amounts of low carbon ferromanganese must be employed. Manganese effect is considerably less than carbon effect in changing machinability indexes on test lathes.

Globular Sulphides Produced—The manufacturer states that the nature of the sulphide inclusions is a major factor in control of machinability characteristics. Melting practices are aimed at producing globular sulphides.

The lower carbon content of MX has an effect on the physical properties that results in a slightly lower yield point, tensile strength and hardness as compared with regular B-1113. However, this change is ordinarily unimportant in utilization of this free-machining steel in the manufacture of a wide range of production parts. From a practical standpoint, experience indicates that the parts case carburize as well as the equivalent standard bessemer grades.

Improvements in machinability, such as tool life, finish and cold working properties are notable. Generally it has been found that on small parts requiring extensive machining, use of the improved bessemer offers sufficiently increased machinability in production to more than offset the slightly increased steel cost. It is predicted that in the long run it will com-

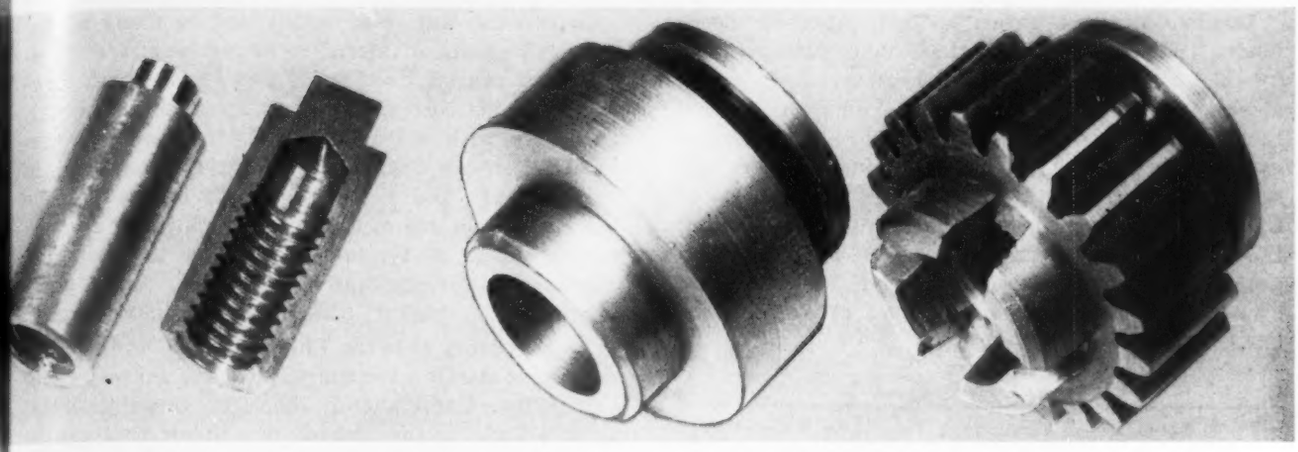


Fig. 2—Washing machine insert machined from ⅝-inch round Ledloy screw stock on 1-inch Greenlee automatic, replacing B-1112 steel. Machining economies effected are shown in Table IV

Fig. 3—Gear for agitator shaft machined from 2¼-inch round Ledloy screw stock on a 2⅝-inch Acme-Gridley, replacing B-1113. Increased production on gear blank offset added steel cost. Real savings were achieved on subsequent hobbing and broaching operations. Table V shows machining economies effected

pletely replace the so-called present-day standard bessemer grades.

Machinability 50% Better—E steel of Jones & Laughlin (U. S. Patent 2,484,231) is a nonrimmed free-cutting bessemer steel having machinability as much as 50 per cent better than that of B-1113 and comparable grades. Finish is also better. Users report increases up to 300 per cent in tool life, together with considerable improvement in production. In addition, the new steel has a better response to forming and cold work.

Three grades of E steel are available: E-15 equivalent to standard grade B-1111; E-23, equivalent to B-1112; and E-33, equivalent to B-1113. Except for the improvements noted, mechanical properties are comparable with these standard bessemer screw steels and the same treatments may be applied.

B-1113 previously has been recognized as having the best machinability of bessemer screw stocks. Numerous attempts to improve it have been made in the past. About 10 years ago leaded bessemer steel made in large tonnages showed outstanding machinability, but the practice of adding lead was not continued. Increasing sulphur content was another approach to the problem, but has been considered impracticable. Experiments have been made with other additives, but none of these achieved the desired result from an economical standpoint.

Process Upsets Old Ideas—The new process by which E steel is made upsets one of the most firmly held ideas concerning composition of free-machining steel. Machinability is associated with a degree of brittleness which permits the metal to chip off instead of tearing off. To obtain this brittleness, it was thought necessary to keep carbon content of the steel as high as possible consistent with the hardness desired. In E, however, the greater machinability has been attained with lower carbon. Carbon content is 0.04 to 0.06 per cent, contrasted with average 0.08 to 0.13 per cent of corresponding grades of the old type bessemer screw stock.

Halving of the normal carbon content is achieved by using as a deoxidizer a medium carbon ferromanganese containing only about 1.30 per cent C. The standard ferromanganese customarily used contains 6.70 per cent C. Bessemer screw steel to which standard ferromanganese has been added reacts violently in the ladle because of gas evolution; further deoxidation is required on teeming. Deoxidized with medium carbon ferromanganese, E steel is relatively dead and seldom requires mold addition. In theory, the comparative absence of gas evolution produces a more homogeneous dispersion of inclusions which is a benefit to machinability.

It is explained that the inclusions which serve as an aid to machinability, such as the various combinations of oxygen with manganese, sulphur and iron, are held to a great degree in their formation state. They are submicroscopic in size and are finely dispersed.

Close Control Is the Secret—Jones & Laughlin has revealed little concerning the actual manufacture of E steel, but it seems obvious that close control of the bessemer operation is an important detail. This company was a pioneer in developing electronic control for timing the bessemer cycle and determining end of the blow.

Good Cold Formability—Noted early in the development of E steel was its ability to cold form more easily than standard bessemer grades. The material was cold drawn to produce bars with smooth finish and close tolerance and this provided a reliable test of cold forming ability. Some of the smaller sizes were reduced approximately 25 per cent in cross section. Less than normal breakage in production was experienced in cold finishing.

Since roll threading, knurling or light coining frequently are performed on parts cut in screw machines, the ability of a free-cutting material to take small amounts of cold work is a definite advantage. Indications are that the new steel is well suited to such applications.

Leaded Steels Improve — The improved open-hearth lead bearing screw stock steel, Ledloy, made by Inland Steel Co., also is to be considered an outstanding development in free machining steels. Although leaded steels were used to a considerable extent prior to the war, they frequently were unsatisfactory for many parts due to segregation of the lead. Improvements in the technique of making the lead additions to the molten metal have improved greatly. The present product has a very fine and even dispersal of the lead particles throughout the bar.

TABLE I

COMPARISON OF PHYSICAL PROPERTIES MX B-1113 (WXB-3) AND REGULAR B-1113

Steel	Yield strength 0.2% offset, psi	Tensile strength, psi	Elongation in 2", %	Reduction of area, %
1/2" Hex B-1113 HR	50,500	66,000	34.0	57.1
1/2" Hex MX B-1113 HR ..	46,500	64,250	34.0	60.7
3/8" Hex B-1113 CD	83,000	88,500	15.5	47.0
3/8" Hex MX B-1113 CD ..	83,000	87,500	16.0	49.8
1 1/16" Rd B-1113 HR	50,000	66,000	31.0	59.2
1 1/16" Rd M+ B-1113 HR ..	46,400	65,150	33.5	62.4
1" Rd B-1113 CD	81,000	90,000	16.0	47.0
1" Rd MX B-1113 CD	83,000	88,500	17.0	50.1
1/2" Hex B-1113 HR	48,200	65,600	32.0	58.4
1/2" Hex MX B-1113 HR ..	39,800	62,700	31.5	57.7
5/8" Hex B-1113 CD	92,300	94,000	11.0	41.9
5/8" Hex MX B-1113 CD ..	86,300	89,400	12.5	45.5

TABLE II

NORMAL RANGE OF MECHANICAL PROPERTIES OF E-33 AND B-1113

(1-Inch Round)

	Yield Point, psi	Tensile Strength psi	Elongation, % in 2 in.	Reduction of area, %
E-33				
Hot-rolled	33,000-43,000	59,000-67,000	27-38	50-60
Cold finished ..	63,000-76,000	73,000-85,000	10-20	40-50
B-1113				
Hot rolled	35,000-46,000	61,000-70,000	25-30	45-55
Cold finished ..	65,000-80,000	75,000-90,000	10-20	40-50

TABLE III

PHYSICAL PROPERTIES OF MX B-1113 AND LA-LED

(1-Inch Round)

	Yield Point, psi	Tensile Strength, psi	Elongation, % in 2 in.	Reduction of area, %
MX B-1113				
Hot-rolled	38,000-50,000	55,000-65,000	27-38	50-60
Cold finished ..	63,000-78,000	74,000-85,000	10-20	40-50
LA-LED				
Hot rolled	33,000-45,000	54,000-62,000	30-38	55-68
Cold finished ..	60,000-70,000	65,000-80,000	12-18	40-55

TABLE IV

MACHINING ECONOMIES EFFECTED IN PART SHOWN IN FIG. 2

		Per cent change Ledloy over B-1112
Form Tool	R.P.M.	152 increase
Form Tool	S.F.M.	150 increase
Form Tool	Feed	Unchanged
Drill	S.F.M.	157 increase
Drill	Feed	Unchanged
Tapping	S.F.M.	150 increase
Time per part	Seconds	39 increase
Production	Per hour	63 increase
Steel cost		16 increase

TABLE V

MACHINING ECONOMIES EFFECTED IN PART SHOWN IN FIG. 3

		Per cent change Ledloy over B-1113
Form Tool	R.P.M.	41 increase
Form Tool	S.F.M.	42 increase
Form Tool	Feed	31 increase
Drill	S.F.M.	40 increase
Drill	Feed	76 increase
Time per part	Seconds	40 decrease
Production	Per hour	67 increase
Steel cost		13 increase

Before the war, lead was added to many of the standard grades of steels, including bessemer steels. The lead bearing free machining screw stock, however, does not correspond to any specific AISI or SAE chemistry with a lead addition. It is a new open-hearth analysis designed to afford the maximum in machinability and yet retaining as far as possible the other desirable metallurgical qualities of an open hearth steel. A typical heat shows the following chemistry: Carbon, 0.10; manganese, 0.95; phosphorus, 0.07; sulphur, 0.27; and lead, 0.21 per cent.

Less Friction Between Chip and Tool—Addition of sulphur to steel is a recognized means of improving machinability. Unfortunately, however, there apparently is a limit to the amount of sulphur that can be added because of difficulties in rolling the steel hot. Increasing sulphur above that present in B-1113 would increase production cost of hot rolled bars. In the search for an additional method to improve machinability, lead has been added. It appears that addition of lead greatly lessens the friction between the chip and cutting edge of the tool, and so permits higher spindle speeds before dulling or burning the tool edge.

A surface speed of 325 feet per minute is a typical starting point in machining the leaded open hearth in automatic screw machines. Results obtained in machining leaded open hearth screw stock indicate an increase in the rate of production on automatic screw machines of 45 per cent over standard B-1113 and approximately 100 per cent over standard B-1112.

Feeds and Speeds Increased—For many parts both spindle speeds and the feeds have been increased. Composition of the steel lends itself well to increases in feeds which have ranged from 30 to almost 100 per cent on various parts as compared with standard B-1113. Although sufficient data have not yet been accumulated from actual production runs with carbide tooling to establish figures, reports to date indicate that remarkable production increases can be anticipated.

Although machinability of a steel always is of primary importance in the production of automatic screw machine parts, other factors such as tool life, finish, ductility, carburizing qualities, cross sectional hardness and freedom from surface defects must be considered also.

In machining the leaded open hearth-screw stock, tool life has been equal to or superior to that realized with standard B-1113 even though great increases have been made in the speeds and/or feeds. In some cases where the automatic screw machine equipment or conditions peculiar to some particular shop have made it impractical to operate at maximum speeds and feeds, great increases in production have resulted from the increased tool life. The leaded open hearth screw stock also permits exceptionally fine machined surfaces.

Better Cross-Sectional Soundness — Ductility and cross sectional soundness are two other factors which must be taken into consideration on many parts. Open hearth steels are regarded as inherently superior to bessemer steels in these two characteristics. Hot rolling records and bar inspection of cold drawn bars shows that (*Please turn to Page* 84)

Answer to Buick Ratchet Problem— "Cut All 15 Teeth Simultaneously"

One modern machine tool handles job which formerly would have called for a "battery" of machines

WHEN Buick Motor division, General Motors Corp., stepped up production of Dynaflow transmissions to 1000 per day, the required increase in output of one particular part of this transmission was achieved by the simple expedient of replacing one machine tool by another machine tool.

The part referred to is a 15-tooth ratchet made in the form of a conventional straight spur gear. Under the old setup, these had been cut at the rate of 12 pieces per hour on an ordinary gear tooth cutting machine. Six blanks were loaded on an arbor—two arbor loads per hour being turned out.

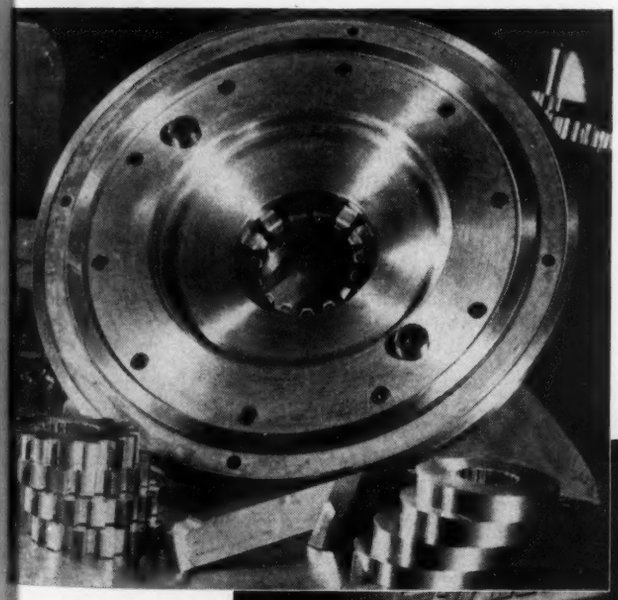
Change-Over Produces Results—Since the change-over, Buick has been producing these same identical ratchets at the rate of 130 per hour. A Shear-Speed type of gear tooth cutting machine now is employed. This machine cuts all 15 teeth simultaneously on stacks of four arbor-mounted blanks.

Fig. 1 shows, in foreground at left, four of these finished 3.166-inch outside diameter ratchets, while in right foreground are four of the blanks prior to cutting. In the background of this photograph is the complete tooth cutting head removed from the machine to reveal its full set of tooth space forming tools.

Return Stroke Cleans Work—The tools cut simultaneously on the work stroke, retract slightly to clean the work on the return stroke, then feed in radially for another cut before the next work stroke—this process being repeated automatically until the blades have reached full depth and teeth are fully formed. An individual cutting blade—removed from a full set of 15—is shown in center foreground of Fig. 1.

In Fig. 2, the machine is shown at the end of a cutting cycle with guards retracted and with its arbor-load of four finished ratchets in the process of being lifted out by means of a work-handling fork. Ordinarily, when cutting head of machine is in this raised position for unloading and loading work, a pan slides under the cutter head to prevent cutting oil from dripping down on the operator's hands. This drip pan was moved aside to permit the taking of this photograph.

To remove tools for sharpening, the cutter head is lowered slightly, the full set of dull form tools



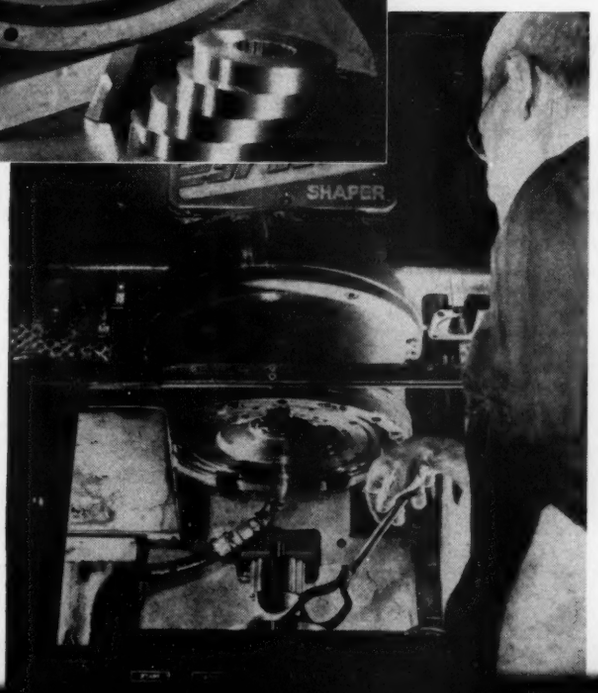


Fig. 1 (above, left)—Radial cutter head in which all blades operate simultaneously on stacked banks (right) to produce toothed ratchets (left). One of its blades is shown in foreground

Fig. 2 (left)—Machine at end of automatic production cycle. Head is retracted and guards are open to permit removal of stacks of ratchets by means of work handling fork

is removed one tool at a time, and a full set of sharp tools is similarly slipped into place. These tools are sharpened by the simple process of grinding from 0.010 to 0.012-inch of material from their top faces in an ordinary surface grinder.

Ratchets Per Grind High—Despite the big output of this machine, production of ratchets per grind of tools is surprisingly high. An average of 1200 ratchets are cut before regrinding becomes necessary. This means that "life expectation" of these blades can be expressed in terms of 48,000 workpieces per set of tools. Theoretically, their life could be extended even further, but under practical operating conditions it works out better in the long run to sharpen the tools regularly once a day—or after processing 1200 ratchets.

As gears go, specifications on these ratchets are not considered strict—their allowable pitch diameter tolerance being up to 0.005-inch. The accuracy of the process is such, however, that "run-of-the-mill" production actually does not deviate more than 0.0015-inch from theoretically exact size.

Cutting Stroke About 2 Inches—Incidentally, thickness of each ratchet is ½-inch. Thus the cutting stroke required is slightly over 2 inches. Pitch diameter of these 5-pitch "gears" is 3 inches, and pressure angle is 20 degrees. The material is SAE 1115 steel.

Before the gear cutting operation, the following operations—in addition to burring and cleaning—are involved in production of these ratchets:

1. Bore, turn and cut off the blanks from bar stock in a bar-working automatic.
2. Feed blanks between disks of a two spindle disk grinder to attain correct thickness and parallelism of faces.
3. Countersink bore.
4. Broach splines in bore.
5. Finish outside diameter by grinding.

Following the subsequent gear cutting operation, these ratchets are heat treated and their bores are given a light finishing cut with a spline sizing broach.

Instrument Gears Broached Accurately at Low Cost

OFTEN heard in production plants today is an edict calling for reduced costs wherever possible. Putting teeth into such an order is a process developed by Colonial Broach Co., Detroit, for the production of small instrument gears. The operation consists of guiding and pushing the parts through stationary ring broaches to obtain the high accuracy and low cost desired.

Gears have 15 teeth, are ¾-inch in pitch diameter and have a 14½ degree pressure angle (see Fig. 1). They are finished broached in 6½ seconds on a 6-ton, 36-inch stroke utility press. Unloading is said to be completely automatic in that the finished gears merely drop into the chute at the completion of the cutting stroke. The part is placed in a recess of a slide which is then manually moved into position below ram of press. No manual clamping is required.

Gear blank is supported in the slide by spring loaded wedges. As the ram moves down, the arbor enters the bore of the gear blank to align it concentrically. The blank is forced downward through the stationary broaching rings by shoulders on the push rod which contact the blank side space. Diagrammatic sketch (Fig. 2) shows broaching setup.

Once the ram has started the broaching stroke, the loading slide may be retracted and reloaded, thus reducing productive time involved for loading to a minimum. The machine cycle time of 6½ seconds includes the automatic high speed return of the ram.

Fig. 1 (below)—One pass broaches the involute teeth of either of these ¾-inch instrument gears in 6½ seconds. Stationary ring broaches are used. Uncut gear blanks are shown adjacent to finished gears

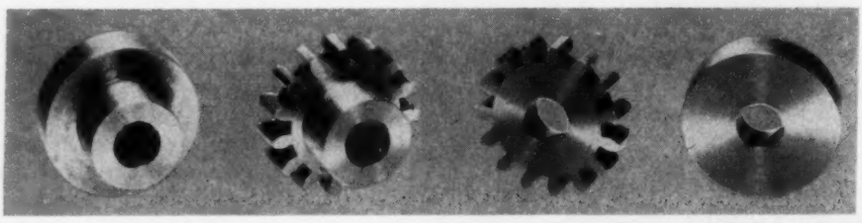
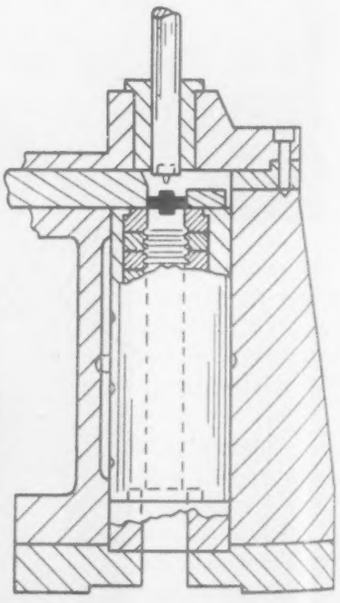


Fig. 2 (right)—Sketch of setup for broaching teeth on four types of small gears on a 6-ton, 36-inch stroke press. Blanks are loaded by a hand slide, then pushed down through stationary and individually replaceable ring broaches in the cylindrical part of the fixture. Ejection is through the bottom and is automatic



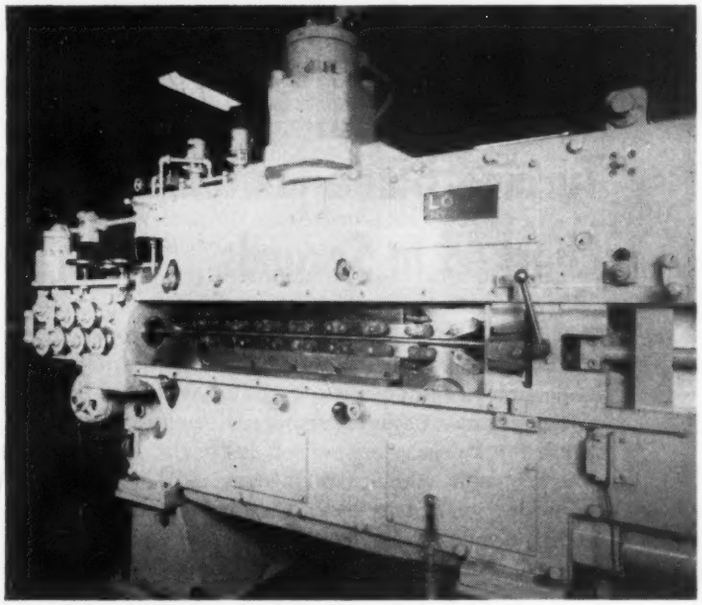
Drawbench Innovations Speed Line Production

Continuous drawing, straightening, cutting, and polishing of both ferrous and nonferrous rods at a speed of 250 feet per minute is possible with newly designed unit

DRAWBENCH design changes, affording increased line processing speed in addition to simplifying the operation, highlight the new Lomatic continuous drawing, straightening, cutting-to-length and polishing machine. This unit processes steel, brass, copper and other nonferrous rods of round, hexagon, square or rectangular sections direct from coiled stock at a rate of 250 fpm depending upon the nature of the metal and required reduction. The original version of this equipment built by Loma Machine Mfg. Co., New York, was described in STEEL, July 11, 1949.

In the new development, essentially the drawbench has been changed, resulting in continuous pulling of the stock through the die at uniform speed. Furthermore, the gripping tool does not have to be changed, irrespective of size and shape of the stock.

Clamping Pressure Adjusted Automatically—Use of two chains, disposed opposite each other, for pulling stock through a processing line, as applied to this drawbench, has been known for many years. However, what is particularly novel in this most recent design is an automatic adjustment of the clamping pressure exerted by the chain in direct proportion to the actual pulling force. This is obtained by variation of the line pressure in the cylinder mounted on the frame of the drawbench and through which the two chains are pressed together. This pressure adjustment is derived from the thrust on a helical gear in the main drive. Heavier thrust action due to greater drawing force results in a corresponding increase of the maximum pressure of the relief valve in the hydraulic system. Clamping force thus is automatically increased for heavier reductions or larger stock sizes, and vice versa, with the result that the clamping pressure is always adequate and



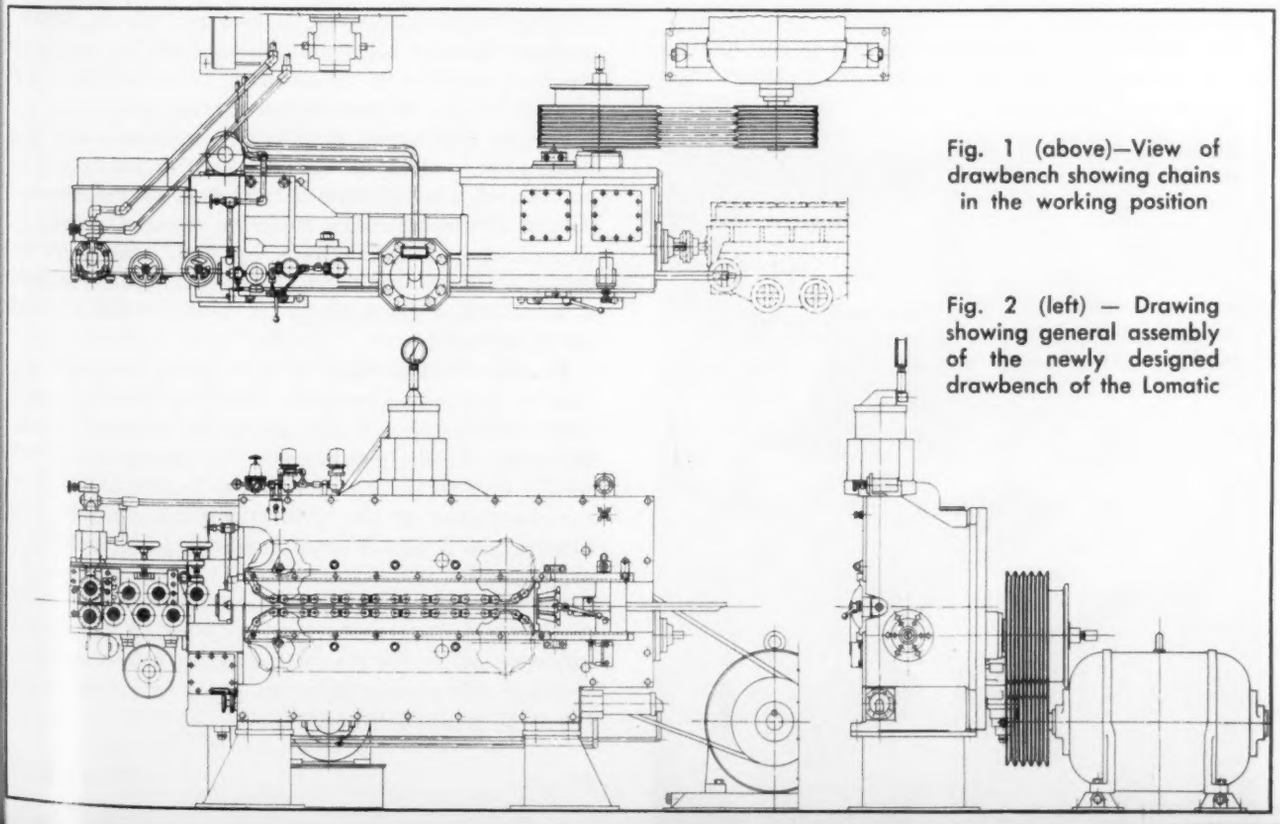


Fig. 1 (above)—View of drawbench showing chains in the working position

Fig. 2 (left) — Drawing showing general assembly of the newly designed drawbench of the Lomatic

not unduly high which could cause marks or impressions on the stock.

Chain Links Form Gripping Jaws—Each one of the two chains runs over two sprockets, one of which is connected to a common gear drive. The gripping jaws are formed by the links of the chains made of hardened tool steel, precision ground and backed up and guided over the working length on the precision ground surface of a cast steel frame. Chain length is such that a sufficient number of gripping links are in contact with the stock to provide a relatively low specific pressure on the working surface. A roller cage is placed between this steel frame and the chains so that there is only rolling friction on the gripping portions of the chains.

The same chains are used for all sizes and sections of stock—no change of tools being required. The only adjustment, which has to be made for varying sizes, is on the lower chain which, by the setting of an adjustment screw, is positioned so that regardless of stock size, material is always pulled through the center of the machine and the drawing die.

Gripping Device Maneuverable—In order to pull the first pointed end of the coil through the die, an auxiliary gripping device of the wedge-jaw type, is provided. This device slides in guides on the drawbench frame and can easily be pushed near the die stand. Jaws are closed by a hand lever and the gripping device moves by action of the chains to the other end where the jaws automatically open and release the stock.

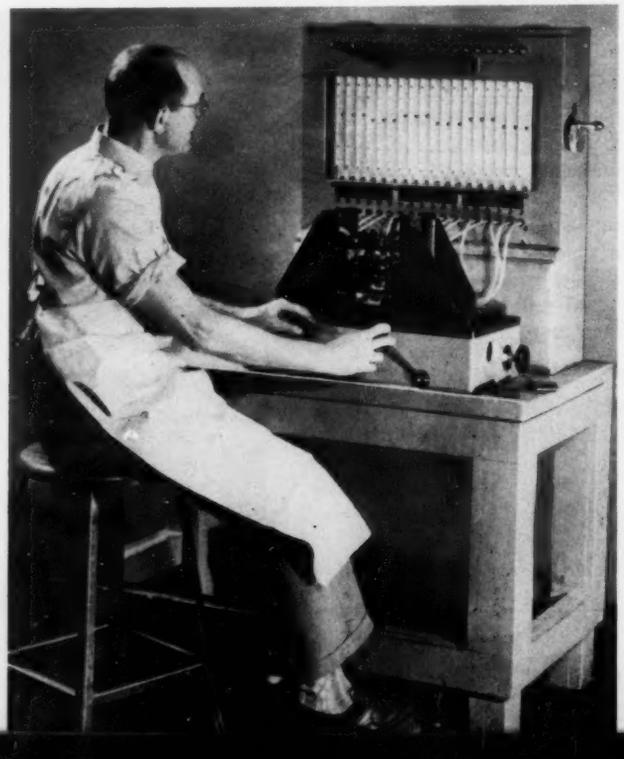
After being drawn the material moves through a roller straightener, is then cut to length on a flying shear after which round stock is passed between two sets of motor driven disks at the entrance and exit end of the straightening and polishing machine, forcing the rod to spin and advance through bushings which, due to their being set off-center, bend the stock and relieve stresses incurred in the preceding drawing operation.

Material then moves on to a discharge table and drops into a rack where it is prepared for shipment.

Turbine Blade Contours Checked in Seconds

WITH increasing importance of jet-propelled aircraft it has become necessary to develop production inspection techniques to keep up with the increase in the number of units required. Among many parts requiring a precise inspection is the jet turbine blade which is now 100 per cent inspected for contour on a production basis by an 18-column Precisionaire fixture developed by Sheffield Corp., Dayton, O. Process is performed as rapidly a blades can be loaded into and unloaded from gaging position, eliminating tedious laboratory checking which was done only on a sampling basis.

No minimum or maximum master gages are required for setting the contour measuring fixture. The instrument makes use of a carefully calibrated turbine blade as a mean master. Gage block buildups are used to properly locate the gaging head mounting plates for the upper, middle and lower calibrated points of check.



After gage heads are clamped into proper position and feeler gages are used to set up the base instrument, not for the calibrated blade, but for a theoretically perfect blade. Positions of the floats in the tube indicate how much the blade being checked varies with the theoretically perfect blade.

Top, Middle and Bottom—The 18 gaging contact points are placed in contact with the blade, a set of three for the internal or concave section and a similar set of three for the external or convex side at the top, middle and bottom. The 18 float positions form a graph of the measurement of the blade, which can be read at a glance, it is reported. If desired, thickness at any point may be checked by comparing the float position in an external tube with the float position in the corresponding internal tube.

On the application illustrated, tolerances are said to be plus or minus 0.0025-inch on the internal check points and plus or minus 0.0075-inch on the external points. Closer tolerance could be checked accurately if desired, or the tolerance could be opened as the columns for external and internal measurement have a total range respectively of plus or minus 0.020 and 0.010-inch.

Handles Various Blades—Instrument is designed so that it may be adjusted to accommodate changes of design and a great variety of jet blades without modifications. Blades may vary or be changed in width, height or contour by more than 1 inch and still be accommodated by the fixture. Interchangeable work holders are required when the root form dimensions are changed.

Fixture may be adapted to make fewer or more for different points of check, for locating the blade at different points, for blades of entirely different shapes and for completely different types of parts where the same principle is applied.

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

TOO ACCURATE AND TOO LATE: These days when there is so much talk about production of work to "tenths" on dimensions and to a few microinches as to surface finish, there may be a tendency in many cases to overestimate necessity for such exact fits and fine finishes.

It is a tribute to the machine tool and tool engineering professions that these fine fits and finishes can be produced and measured under production conditions. They certainly do contribute to perfection in many high grade mechanisms. However, they can be misused to disadvantage as well as used to advantage. Those who specify fits and finishes on drawings must use common sense and good judgment.

During World Wars I and II lively controversies took place in ordnance circles as to the limits required on rifle and automatic gun parts. In some cases the degree of accuracy required for practical interchangeability of parts was greatly overestimated —particularly by some of the ordnance officers. Private industry was inclined to be more literal about these things. The consequence was that the civil and military authorities clashed—with the evil result that perfectly usable arms were held up.

I recall a classic story about the late John M. Browning, famous civilian inventor of repeating firearms.

Being called to a World War I proving ground to diagnose operational difficulties experienced with his light automatic rifles—just then being put into production—he discovered that too closely fitted sliding members were becoming jammed by dirt.

"If you can't keep dirt from getting in, make the mechanism loose enough so the dirt will fall out," is on old slogan among gunsmiths. Acting on this, Mr. Browning—to the horror of the ordnance officers —"rasped off" some of the metal from some of the beautifully fitted sliding members. Then he reassembled the gun, lubricated it with a squirt of tobacco juice—and it met the tests.

"Loosen up on some of those manufacturing limits in the armories and you won't have so many shooting troubles in the front lines," was John M. Browning's advice back in 1917. There may be some food for thought in that advice in connection with a lot of things which we soon may be called upon to make in a hurry in this crucial year of 1950. "Too accurate and too late," can mean "Too little and too late!"

BLISS PRESS BOOK: It has been said of the pressed metal industry that there is more in the heads of practitioners about the techniques involved—and less in the books—than is true of any other branch of the metalworking business.

Be that as it may regarding the techniques—and I am inclined to believe that it is all too true—an important step has at last been taken by one company to correct the situation.

I have just received from John J. Feeley, former advertising manager of E. W. Bliss Co., Toledo 7, O., now on the staff of Fred Wittner, Advertising, 581 Fifth Ave., New York 17, a copy of the first revision and expansion of the *Bliss Power Press Handbook* that has been made in more than 20 years. This 700-page book certainly reflects the progress made in press design, construction and tooling in the past two decades.

When it is considered that in its more than a century of activity the Bliss company and its subsidiaries have built more than 200,000 machines for blanking, forming, drawing, squeezing and rolling metal, it becomes understandable that this organization is in a position to turn out a really broad gage book for engineers, production executives, industrial students and others concerned with operation of presses and dies in the mass production of metal products of all kinds.

As metals have become short in supply and more expensive, as cost of manpower has risen and as demands for intricate, lightweight, low cost parts have increased by leaps and bounds, production by means of presses has elbowed its way right into the front lines of industry. Should we have to convert to large scale production of war materiel, press work is destined to loom up even larger in importance.

It is at this psychological moment in our industrial history that this *Bliss Power Press Handbook* makes its appearance. It costs $7.50 which is a very reasonable price for a volume of its size and caliber.

INDISPENSABLE PIPELINES: As an "alumnus" of the original (1948) Machine Tool Sales Refresher Course staged jointly by the National Machine Tool Builders and American Machine Tool Distributors' associations, I am revisiting the campus of Cornell University this week.

Marketing of machine tools—either through direct representation or through dealer organizations—is a very different type of activity than door-to-door peddling of pots and pans. Nevertheless, governmental authorities during the critical industrial period of the last war, drew little or no distinction between the two groups. We were mighty close to a blanket ruling that machine tool salesmen be considered superfluous.

Actually, our machine tool sales organizations constitute a splendid system of "pipelines" through which indispensable, up-to-the-minute tooling and production information flows swiftly from the machine tool builders to machine tool users throughout the length and breadth of America.

The NMTBA-AMTDA sessions this week at Cornell —and their counterparts, August 21-25, 1950, at Purdue—present golden opportunities for the machine tool industry to "inoculate its sales forces with fresh production engineering virus." Cornell and Purdue also should be used as powerful broadcasting stations to sock the truth about machine tool salesmen into bureaucratic minds responsible for their status.

Acid Salvaging Process Cuts Pickling Costs

New process includes concentration of free acid, separation of crystallized ferrous sulphate by filtration and converting the sulphate to fresh sulphuric acid. First two procedures recommended for steel mills using low consumption of acid

By F. J. BARTHOLOMEW

Sales Executive
Chemical Construction
New York

ATTRACTIVE savings for the steel industry are forecast through the use of a new process for salvaging spent pickling acid. Instead of running the spent acid to waste the free acid left in the pickling bath is concentrated for further use and the iron sulphate is filtered out either for dumping as such, or for use in the production of iron oxide and sulphuric acid.

The steel and titanium pigment industries are faced with the problem of disposing huge quantities of waste pickle solutions containing iron sulphate and free sulphuric acid. In the steel industry the product is the result of treating sheet steel with hot sulphuric acid to remove scale and rust. In the titanium pigment industry it is the result of digesting titanium ores with sulphuric acid to make possible the separation of the iron from the titanium.

Steel mills still surface-clean their heavy plate by the batch process, replenishing their bath with sulphuric acid until it becomes fully saturated with ferrous sulphate and only 2 to 5 per cent of free sulphuric acid is left. The entire batch is then dumped and a fresh sulphuric acid bath is prepared.

Acid Drawn Continuously—In the modern mills running at high capacity, steel is cleaned in a continuous process and pickling solution of 10 to 15 per cent free acid by weight and 10 to 15 per cent $FESO_4$ is drawn from the vats continuously at a temperature of about 210°F.

With the price of steel at its present high level, volume of output is of major importance, and the cost of acid used for pickling is a minor item, hence the higher acid content of the pickling liquor which is run to waste.

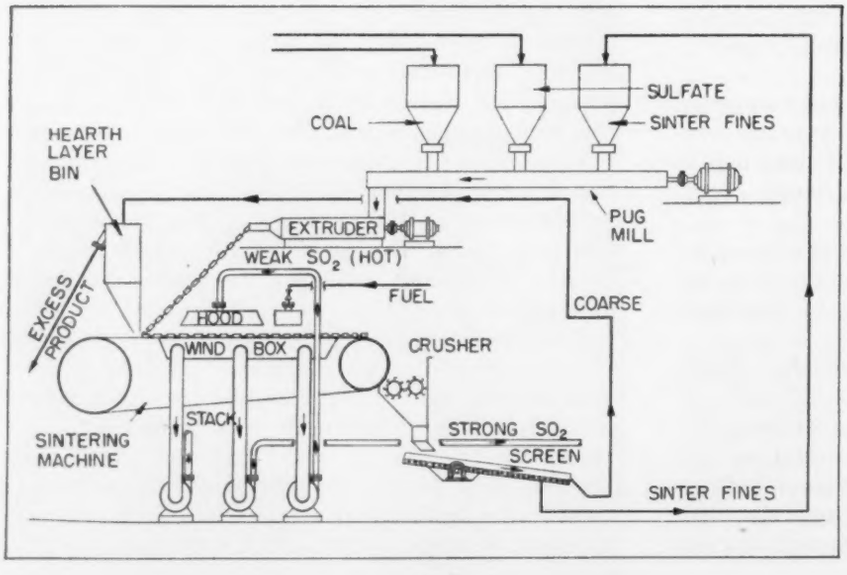
Sought Method of Freeing Acids—About four years ago the author's company started a fresh assault on the problem, having in mind the concentration of the free acid in the waste liquor to the point where the iron sulphate would drop out in filterable form and leave the acid generally free of sulphate and suitable for reuse in the client's plants. Since the cost of water evaporation is a major item of expense in processing this waste product, any economy that could be gained in this respect would be most welcome. The direct application of high temperature combustion gases beneath the surface of the waste liquor has the advantage of high heat efficiency and naturally the higher the temperature differential, the greater the efficiency. This principle has been used in Chemico sulphuric acid concentrators for more than 25 years, but combustion gas temperatures were limited by the use of acidproof iron dip pipes which, although able to withstand the corrosive action of the acid could not be used at the temperature where the best heat efficiencies could be affected.

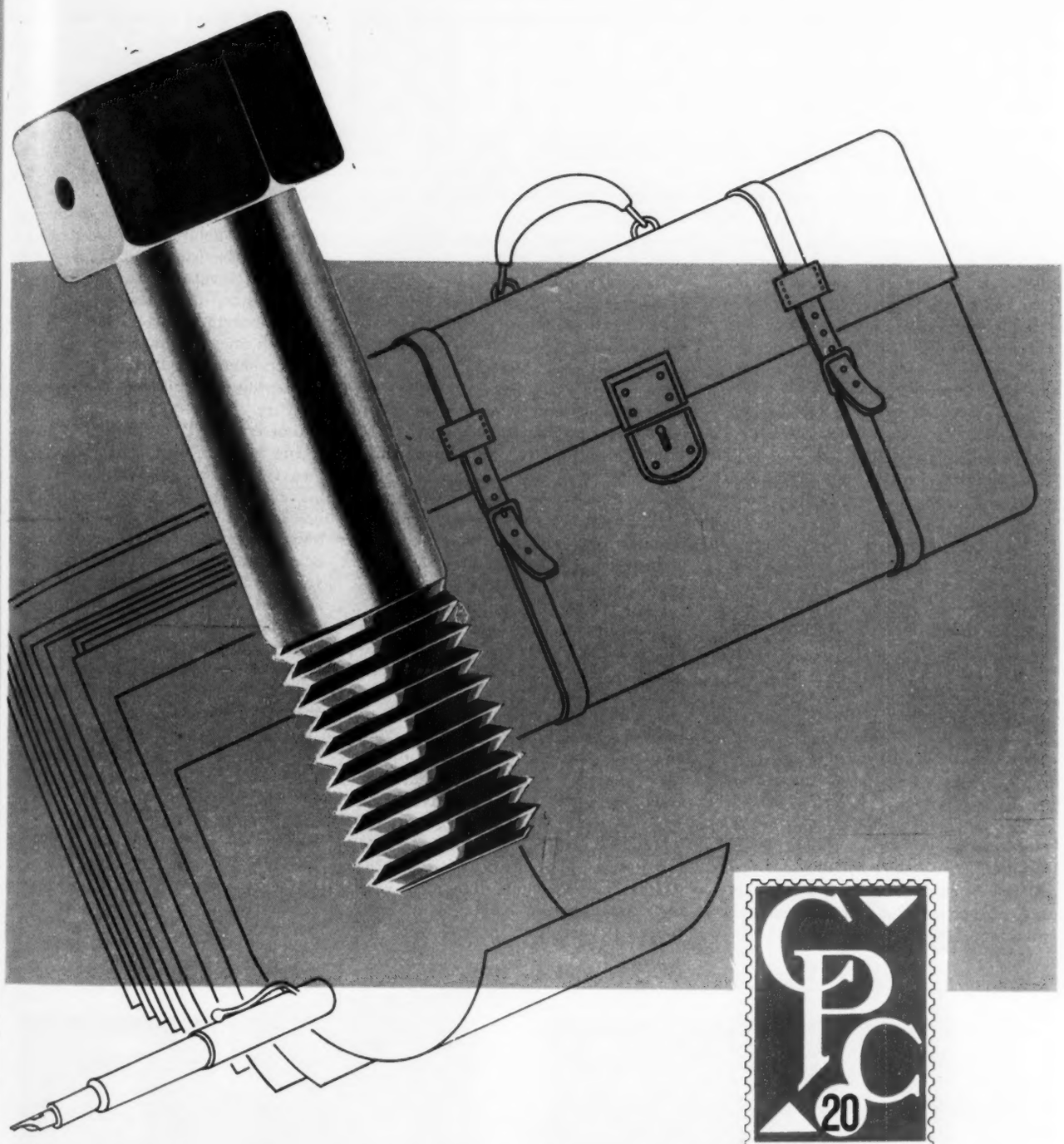
New Dip Pipe Designed—After some initial failures we designed a dip pipe that was able to withstand the corrosive action of the acid, on the outside and the high temperature of combustion in the dip pipe. A special burner, adaptable for the use of gas or oil, and connected to the simple dip pipe, completed the heat producing unit.

Preliminary concentrating experiments developed the fact that the sulphate, which was precipitated when the acid was concentrated to a strength of 60 per cent H_2SO_4 or higher, dropped out with 1½ molecules of water and in readily filterable form. Anyone who has tried to filter precipitated iron sulphate will appreciate the importance of this characteristic. It speeds filtration and permits washing of the cake with the minimum of wash water thus producing a product that may be dumped as such or processed further for the production of iron oxide and sulphuric acid.

Tests Proved Encouraging—The preliminary experiments covering

Flow diagram of sintering plant for processing iron oxide





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concentration of the acid and the filtration of the precipitated ferrous sulphate were completed and proved encouraging, but the problem of processing the precipitated sulphate still confronted us.

In early work on waste liquor recovery, sintering machines were used for the roasting of sulphate with some success. We turned again to this type of equipment as the logical substitute for rotary kilns. Extrusion of a mixture of ferrous sulphate, coal and ground sinter through a perforated plate gave a product that was satisfactory for sintering machine operation. The sintered material was a hard spongy oxide of iron, in lumps particularly well suited for steel plant use. Gas from the sintering machine was low in dust content and sufficiently high in sulphur dioxide to assure easy contact acid plant operation.

Liquor Processed in Tons—A semi-commercial plant was installed at Piney River, Va. The unit was designed to process 50 tons of liquor per day containing, on the average, about 12 per cent H_2SO_4, 20 per cent $FeSO_4$ and the balance water. A cone bottom steel tank, lead and brick lined, served as the concentrating vessel and a combustion dip pipe that was fired with light fuel oil supplied the heat for the evaporation of the water.

The unit was designed for continuous operation with waste liquor charged in a steady stream and part of the recirculating magma consisting of precipitated ferrous sulphate and concentrated acid being continuously withdrawn for filtration of the solids. A vacuum filter of the Oliver rotary type constructed of lead and with plastic filter cloth filtered the sulphate and washed the filter cake.

The filtrate containing about 60 to 70 per cent H_2SO_4 and about 1 per cent iron sulphate was sent to storage and stored temporarily for use in the titanium plant or for sale to manufacturers of superphosphate.

Recovered Steel Pickle Liquor Good—There is some difference of opinion as to the suitability of this acid for reuse in the pigment industry but acid recovered from steel mill pickling liquor could certainly be used again for pickling since only part of the pickling bath would come from concentrated acid.

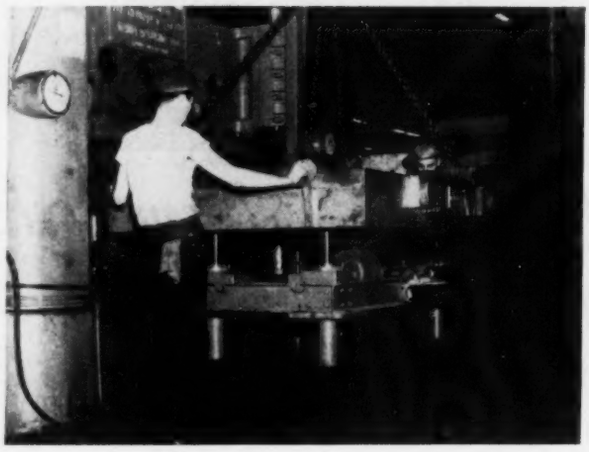
Incidentally, a second step of concentration was also carried out and acid of 93 per cent strength obtained. It is likely that acid of this higher strength will not retain appreciable quantities of objectionable ingredients. Certainly the iron sulphate content would be negligible.

Returning to the operation of the Piney River unit, the iron sulphate was mixed in a pug mill with about 12 per cent of its weight of coal and a quantity of crushed oxide from the Dwight Lloyd sintering machine and then extruded through a perforated plate to form ¼-inch diameter cylinders which broke off in lengths of ¼-inch to ½-inch. The extruded pellets fell directly on a moving grate for drying and then on the sinter machine on which a protecting coat of roaster cinder had already been placed. The dried pellets were ignited from above while air was drawn down through the bed. The coal in the pellets supplied sufficient heat to decompose the ferrous sulphate into sulphur dioxide and iron oxide. Incipient fusion of the magnetic iron oxide took place and the material was discharged in large porous chunks.

A portion of the sinter discharged from the machine was diverted to a rough crusher and then conveyed by belt and elevator to a screen where the oversized particles were returned to the hearth layer bin and the undersized fines discharged to a secondary crusher and thence elevated to the sinter fines bin for the extrusion mixture.

Gas Travels Two "Paths"—The sintering machine wind box was divided into two parts. Strong gas averaging about 7½ per cent SO_2 from the one portion was sent through a scrubbing tower and then through a coke box after which it was in condition suitable for processing in the contact sulphuric acid plant. The gas from the other section containing little SO_2 was circulated over the drying section where it dried the pellets and then discarded. It contained less than 0.1 per cent of SO_2.

Several features of the new process will bear some further explanation. For economy in cost of water evaporation, high temperature methods are rated highly. By such method, the volume of combustion gas is kept to a minimum and therefore air pollution is kept at a minimum. When concentrating the spent acid to an optimum strength of 60 to 70 per



SERVES SEVERAL MACHINES: Moved about as required by an overhead crane, this positioning table is serving several machines in the Peoria, Ill., plant of Caterpillar Tractor Co. Expediting placement and removal of heavy dies and tools, the table promotes safety and eliminates hazard of damage to dies, tools, machines and environs. It is accurately positioned at each machine (left) by insertion of four false legs into holes in the floor. Die is placed on table by overhead crane; table is electrically elevated or lowered. Dogs which travel across the table face are energized, moving die into position (right). Removal of the die is accomplished by reversing the travel of the dogs

NEW INSPECTION METHOD

Clean Surface

STEP 1

Apply Dye Penetrant

STEP 2

Remove Excess Dye

STEP 3

Apply Developer
Flaws Are Revealed

STEP 4

These four simple steps enable anyone to determine the location, extent, and nature of surface flaws or discontinuities in any metal.

Four Simple Steps for Easy, Economical Quality Control & Preventive Maintenance

The Dy-Chek inspection process involves the use of three special liquid compounds, non-corrosive and easily applied by brush, spray, or dipping. STEP 1—Clean surface with Dy-Chek Cleaner; STEP 2—apply red Dye Penetrant; STEP 3—remove excess Penetrant with Cleaner; STEP 4—apply white Developer ...brilliant red indications appear quickly if flaws are present.

Requires no electricity, lights, or special installations

The *only* requirements for Dy-Chek inspection are the three liquids, and simple equipment — such as brushes, sprays, or dip tanks — for applying the liquids.

Dy✓Chek Inspection Can Be Used Anywhere!

Complete portability takes rigid inspection into the field for use by anyone without special training. Dy-Chek's low cost extends precise inspection to even the smallest companies. Ample supplies for inspecting large areas of metallic surface can easily be carried to any location. On the other hand, the simplicity of the process lends itself equally well to installation in a plant for production-line inspection.

SOLD DIRECT

dy✓chek COMPANY

division of Northrop Aircraft, Inc.

1507 EAST BROADWAY
HAWTHORNE, CALIFORNIA

dy✓chek —*the dye penetrant inspection method*

Revolutionary DY✓CHEK TRADE-MARK Process Quickly Inspects Any Metal For Flaws

DY-CHEK, THE DYE PENETRANT METHOD OF INSPECTION* permits *anyone anywhere* quickly and conveniently to inspect *any* metal for flaws or discontinuities having surface openings. Castings, forgings, machined parts, plate, sheet, tubing, weldments ... aluminum and its alloys, cobalt, copper and its alloys, iron and its alloys, magnesium, nickel and its alloys, etc... magnetic and non-magnetic ... all can be surface inspected by the Dy-Chek process. *The surface need not be smooth.* Dy-Chek is a proven economical process developed by Northrop Aircraft Research, and is *already widely used in many industries.*

*Pat. Pend.

Positive Dy✓Chek Indications Clearly Reveal Flaws

Dy-Chek inspection reveals both the nature and extent of surface discontinuities. A Red Line indicates a crack, cold shut, or similar opening; Red Dots indicate pits or porosity; a Series of Red Dots in a Line indicates a tight crack or cold shut, or a partially welded lap. The extent of the flaw *on and beneath the surface* is easily estimated by the width of the Dy-Chek indication.

SEND TODAY for COMPLETE INFORMATION

The simple, economical Dy-Chek process is available immediately for manufacturing inspection, receiving inspection, and preventive maintenance. Write today for complete details on how to simplify *your* inspection problems.

Dy✓Chek Company
1507 East Broadway, Hawthorne, California

Send by return mail complete details on the Dy-Chek Dye Penetrant Method of inspection for any metal.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

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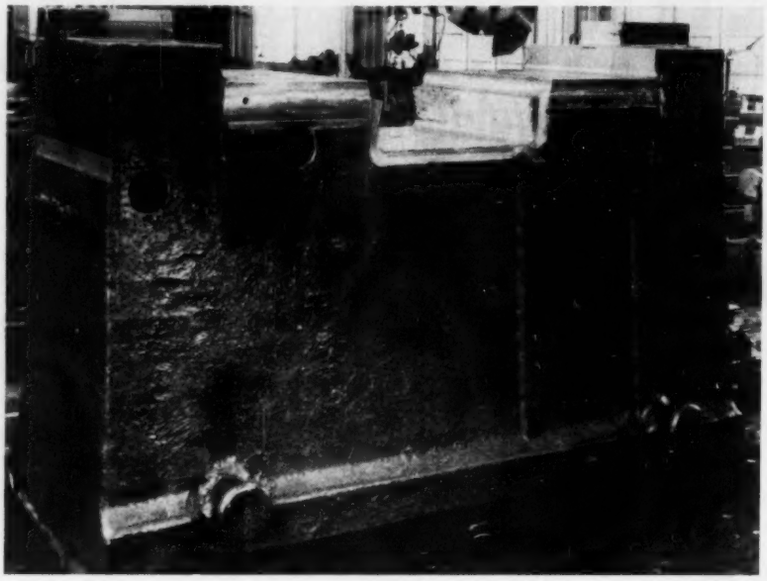


YOU LIFT THE OTHER END: Weighing over 145 tons, this cast steel anvil base for a 20,000 pound forging hammer was cast in one piece in a single mold. According to Continental Foundry & Machine Co., at whose East Chicago, Ind., works the casting was poured, extremely difficult and delicate pouring operations were involved. Three open hearth furnaces were required to melt the steel necessary for the 6 foot 3 inch by 14 foot by 9 foot 5 inch casting. It was allowed to cool for eight weeks before the sand was removed

cent H_2SO_4, some means of abating possible air pollution would have to be used. We would use the newly developed Peace-Anthony venturi scrubber which is highly efficient on this type of gas and elimination of objectionable fumes from the concentrating unit would be guaranteed.

Roasting of extruded pellets of iron sulphate with coal or pyrite on a conventional sintering machine is a big improvement over kiln roasting of dehydrated sulphates. The sintered-product is in much better form for charging blast or open-hearth furnaces; the gas is sufficiently high in SO_2 content for processing directly to sulphuric acid and dust is no longer the serious problem it was in the kiln roasting operation.

Produces Recoverable Sulphate— Steel mills operating at a lower rate of acid consumption might find the investment too heavy if the complete process were installed. In such cases only the concentrating and filtering procedure is recommended. This recovers about 85 per cent of the sulphuric acid delivered to the recovery plant and produces a sulphate that can be piled away on slag heaps or shipped as raw material to a nearby sulphuric acid manufacturing plant.

In recent studies, we have found that if the sulphuric acid is concentrated and the filtered monohydrate converted into sulphuric acid, the investment required in the complete installation would pay for itself in 4 to 8 years depending on the cost of new acid delivered in the locality of the recovery plant and other attending factors. If only recovery of the free acid is desired and there is a convenient means of disposing the monohydrate, either to waste or to some manufacturer of sulphuric acid, the investment would pay for itself in 6 to 12 months even if there is no sale value for the iron sulphate.

In the first case credit is taken for iron sinter returned to the mill and in both cases it is assumed that the client would otherwise have neutralized his waste liquor and credit is taken for such neutralizing costs in arriving at the above figures of pay off time.

From data presented before Process Industry Conference, American Society of Mechanical Engineers, Pittsburgh, April 24-27.

Fine-Pitch Gears Standardized

FINE-PITCH gears, essential in the manufacture of computing devices, small automatic mechanisms and other precision instruments, are the subject of three new standards, announced by American Standards Association, New York. Covering straight bevel gears, design for worms and worm gears and 20-degree involute system for spur and helical gears, the standards are part of a gear standardization program developed by a committee organized under the procedure of the ASA and sponsored by the American Gear Manufacturers Association and the American Society of Mechanical Engineers.

Plating Promises Cost Savings

SMOOTHING and leveling of electrodeposits was one of the new developments in electroplating brought out at the Fourth International Conference on Electrodeposition, held last month in Boston, which is expected to bring about important cost savings.

Papers presented at the symposium on the subject showed that recent work has proved that plating can be conducted in such a fashion as to greatly improve the quality of the surface of a workpiece during the plating operation itself. All or a major part of the expensive polishing and buffing operations which have contributed to the cost of electroplating for decorative purposes may be eliminated, it was said.

It was brought out that the older ideas concerning throwing power and metal distribution are inadequate to explain such effects as those reported by C. E. Reinhard of New Jersey Zinc Co. in his paper on micro-throwing power. This paper showed how small surface defects are filled with the metal during some plating operations in a manner that defies explanation by known scientific principles and theories. Improvement in surface quality which results from such plating is important.

Immune to Solution Attack

UTILIZING the acid resistance of nonmetallic materials are exchanger tubes of Karbate impervious graphite, said to be immune to attack from all pickling and plating solutions except those containing nitric and chromic acids. Made by Nukem Products Corp., Buffalo, N. Y., the exchanger units have good heat transfer qualities, making possible a small, light and compact unit.

The high heat transfer characteristic is utilized by circulating the acid solution through the tubes at a high velocity by a Nu-Kast No. 166 pump, also made by the company. Having a flow of about 80 gallons per minute at a low head, the pump requires only ½-hp. Acid connections are made with Neoprene hose and stainless steel worm drive clamps, said to provide flexibility and simplicity in dismantling for cleaning and servicing.

Assembly Time on Terne Plate Tanks Cut By Forty Per Cent

Change in welding technique effects a saving of 43.85 hours per 100 lead-covered steel tanks

BY R. D. WASSERMAN
President
Eutectic Welding Alloys Corp.
New York

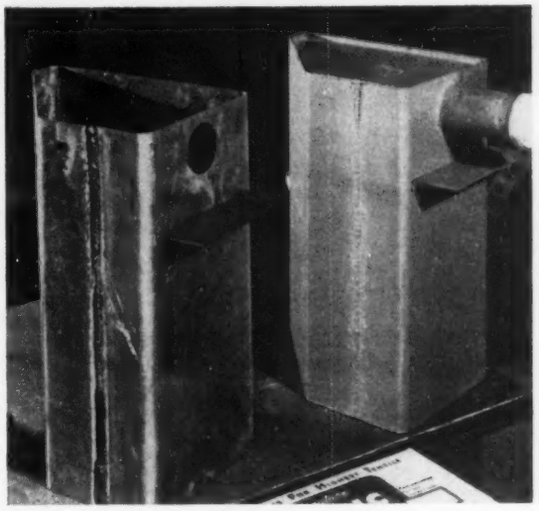


Fig. 1—Almost every conceivable type of weld was used to produce this tank. Butt weld for the shell, flange weld for the two end inserts, fillet type weld for the filler tube. Completed and partially finished tanks are shown

TERNE plate, or lead-covered steel, has always presented great difficulty when welded assemblies of this metal were attempted. Because the melting point of lead is 620° F, heat of the arc or the torch would inevitably melt the lead long before the bonding temperature of the underlying steel was reached. The molten lead would either form an oxide coating on the steel, preventing the filler rod from bonding, or at best it would result in a very porous weld.

Stolper Steel Product Corp. of Milwaukee, one of the largest manufacturers of terne plate and mild steel gas tanks were faced with this same problem. They were forced to spend much more time on the assembly of each tank than they felt they should actually spend. Preparation and cleaning consumed disproportionate amounts of time. Not infrequently it was found that the finished assembly was not gastight, so that more time was lost in inspection and additional welding in order to leakproof the tank. All told, the time needed to complete one hundred tanks was 110.55 hours.

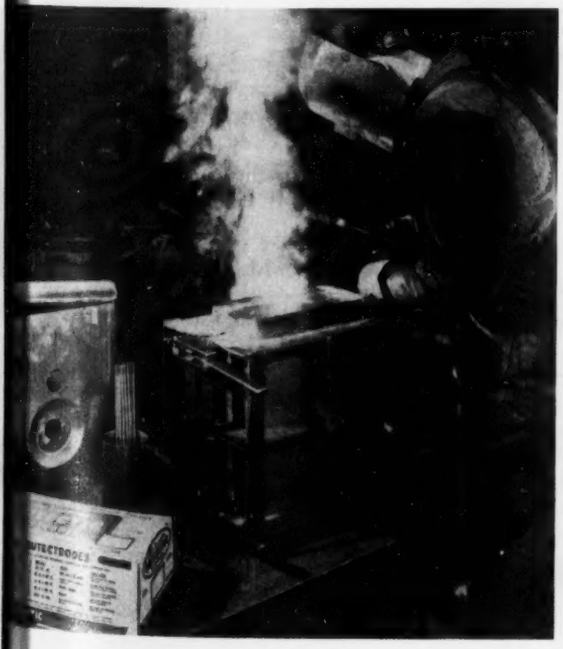
40 Hours Lopped Off Assembly Time—Using a 3/32-inch Steel-Tectic rod, the company now cuts hours off the previous production time. On a trial run, after 100 tanks were finished, it was found that more than 40 hours had been trimmed off the assembly time.

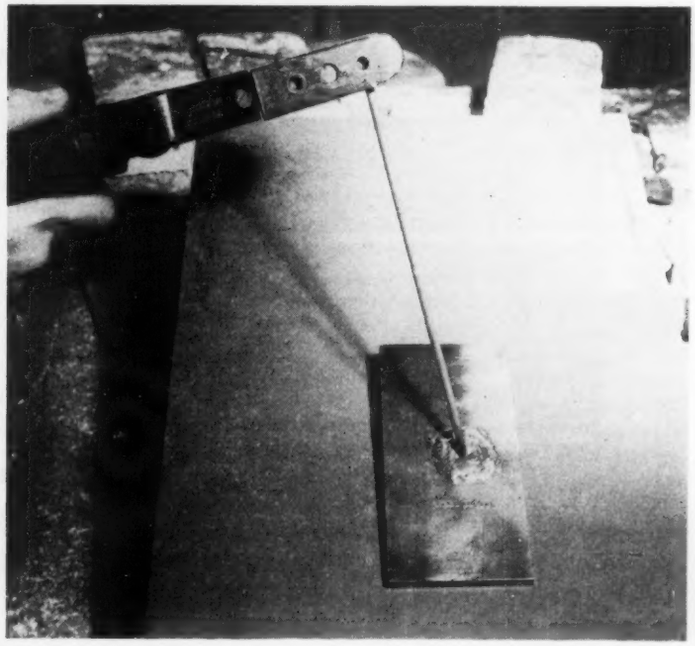
Actual time study figures used by the company for incentive puposes on production runs are shown:

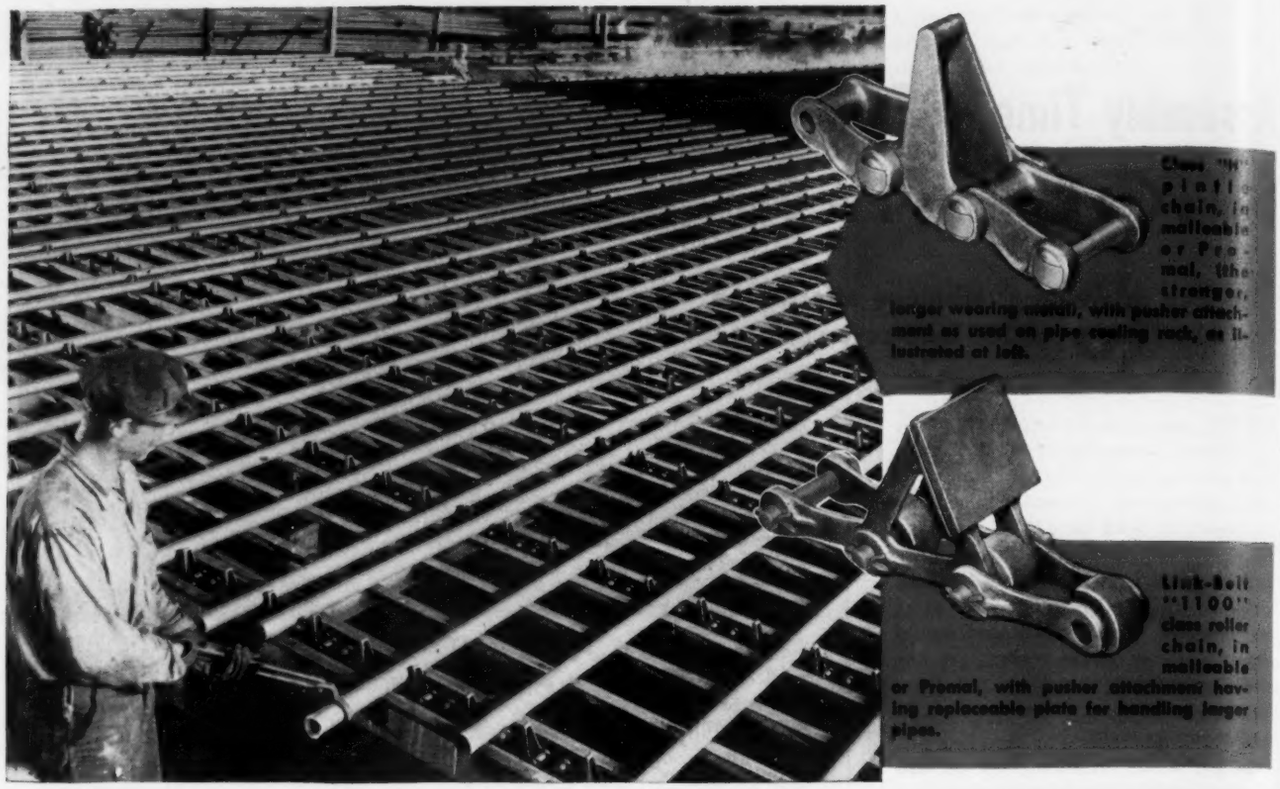
	Steel-Tectic Hrs	Previous Rod Hrs
Arctack and weld complete	45.66	81.06
Wire brush welds	6.78	8.33
Test and repair leaks	14.26	21.16
Total	66.70	110.55

Fig. 2 (left)—During welding operation on tanks, a fixture holds the separate parts in place and obviates the need for individual alignment of each assembly

Fig. 3 (below)—Hole filled completely without creating a core of slag. Slagless filling of such a hole is shown here





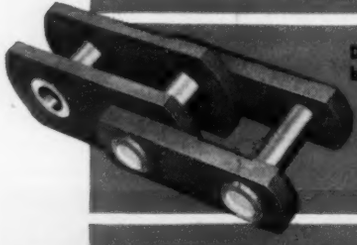


Class "W" pintle chain, in malleable or Pro-mal, the stronger, longer wearing metals, with pusher attachment as used on pipe cooling rack, as illustrated at left.

Link-Belt "1100" class roller chain, in malleable or Pro-mal, with pusher attachment having replaceable plate for handling larger pipes.

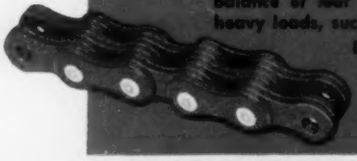
When the Job calls for CHAIN— call for LINK-BELT

Plate and slab transfer chain for cooling beds; 300,000 lb. chain with tilting dogs illustrated—can be equipped with ducking or rigid dogs.

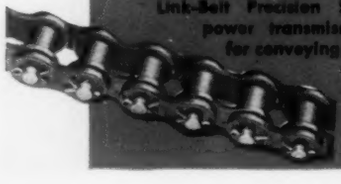


Draw-bench chain, bushed ladder type, for high speeds and elimination of chatter. Also furnished in conventional block type.

SS-388 chain, for roller-and-catcher tables, light and strong for the exceptionally tough service of this application.



Balance or leaf chain, for supporting heavy loads, such as billets at forging presses.



Link-Belt Precision Steel roller chain, for power transmission, also widely used for conveying, with or without various attachments.

Link-Belt chains are built to take the brutal punishment of steel mill service, dependably, turn after turn, year after year. For particularly grueling tasks, there are specially developed Link-Belt chains, and throughout the mill, standard types for the basic elements of complete handling systems.

There's a Link-Belt chain for every spot, and Link-Belt is the spot to go for every chain.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices, Factory Branch Stores and Distributors in Principal Cities. 11,377

LINK-BELT

Chains and Sprockets

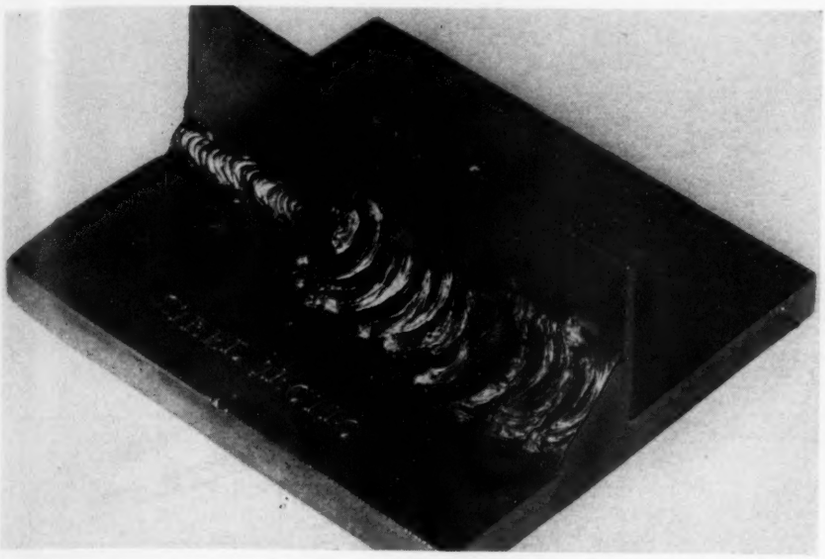


Fig. 4—Three successive passes were welded nonstop; slag was chipped after the last pass only

Figures shown are time required for 100 tanks.

"Arctack and weld complete" accounted for a saving of approximately 35 hours. Not having to remove the slag from all the arc tacks, plus the fact that considerably higher welding speeds are possible with the new welding electrode, and the fact that the lead does not hamper the operation too seriously, no doubt accounts for this surprisingly high figure.

Wire brushing time yielded a reduction of 1½ hours. This is more or less self-explanatory.

Final savings is encountered in testing the tanks and repairing those found to be leaky. Since the welds made with the electrodes are exceptionally dense, and porosity free, a much smaller percentage of rejects is naturally the result; the time to reweld, and retest was thus slashed by some 30 per cent.

All Types of Welds Used—Tanks from which these time-study figures were computed are shown in Fig. 2. As in most cases of mass-production, a fixture holds the separate parts firmly in place during the welding operation. This practice obviates the need for individual alignment of each assembly. To the left of the welder is shown a partially completed assembly, ready for the next welding operation.

The company manufactures tanks to customer's specifications. Hundreds of shapes, styles, and sizes, are involved, two of which are shown in Fig. 1. Note that for the tank in Fig. 1 just about every conceivable type of weld was employed: Butt weld for the shell, flange weld for the two end inserts, fillet type weld for the filler tube. A completed tank, as well as a partially finished one is shown.

No Intermediate Slag Chipping—The welding rod employed by Stolper on the job described above can be used for multiple pass welding without intermediate slag chipping. In fact, while testing this electrode in the laboratory, as many as half a dozen passes have been made with it, chipping the slag only after the last pass. Taking the cross section of this sample, not the slightest trace of slag inclusion was detected; the inherent characteristics of the electrode cause each successive layer of slag to float to the top, so that all impurities can be chipped after the last pass. Thus, it is possible to fill a hole completely, without creating a core of slag. The slagless filling of such a hole is shown in Fig. 3, while Fig. 4 shows three successive passes welded nonstop, the slag having been chipped after the last pass only.

Movies Depict Machining

COST reducing advantages and special design features of turning equipment in use in metalworking industries is shown in graphic form in five sound motion pictures, produced by Monarch Machine Tool Co., Sidney, O. Running 23 minutes is "The Air-Gage Tracer", covering contributions to tracer-controlled duplication by showing variety of typical job applications related to contour turning, facing and boring as well as multiple-diameter shaft turning on the company's 10 to 32-inch engine lathes equipped with this tracer.

The Speedi-Matic electronically-controlled precision hand screw machine, with design features and typical operational sequences are included in "The Speedi-Matic", running 23 minutes. The machine capable of ultra-precision turning, boring and facing in the toolroom, with specific examples of operations involved, is shown in the 22-minute film, "The 10-inch Model EE Sensitive Precision Toolmaker's Lathe". Numerous representative, diversified turning operations are shown in two 18-minute films entitled "Mona-Matic Magic". The first reviews basic design features and operational principles while the second shows in rapid succession both typical and unusual examples of work being handled by the machine.

Smart To Wear Safety Glasses

OPENING with an emotional appeal for workers to realize what their eyes mean to them, then showing how easily eyesight may be lost and that such loss is personal is a safety training film made available by National Safety Council, Chicago. Entitled "Easy on the Eyes," the film shows what glasses are best suited for specific jobs, presents case histories of injured workers and the testimony of blind persons. Film is available in 35 mm sound slidefilm and 16 mm sound-motion picture forms.

Time To Retire Old Meters?

ECONOMIC point at which to retire older watthour meters may be determined by a circular evaluator developed by the Meter and Instrument Division of General Electric Co., Schenectady, N. Y. It is based on an economic formula developed by company engineers and is fully described in the brochure, "Time to Retire Old Watthour Meters?"

Comparison of cost of retiring and cost of keeping in service as determined by the evaluator, gives an answer to the question of when is it economic to retire a group of meters. Resembling a circular slide rule, the evolutor has scales for settings to include such factors as cost of new meters, age of old meters and excess annual cost of old meters over new equipment.

Land of the free!

. . . where enduring copper is a symbol of our better way of life . . . where copper and its alloys provide a myriad of useful, low-cost, mass-produced conveniences. Take this Jarco Key-Chain Flashlight: Solid brass deep-drawn shell and cap; solid brass screw-machined, threaded and knurled nut; solid brass bead chain; battery, tension spring and focused bulb. Made by Jarco Metal Products Corporation, New York. Sold by the millions at 39¢ retail.

Anaconda

It works–weather or not

When the H. S. Getty Company, Inc., Philadelphia, designed its "Internal Gear Construction Window Operator," many difficulties presented themselves. First, it had to be non-rusting, corrosion resistant and yet moderate in cost. Regular brass alloys answered that. But–some parts, such as the operating arm and machine-cut worm, needed extra strength and stamina to resist the stresses caused by rain-swollen or iced-up sash. Everdur, The American Brass Company's Copper-Silicon Alloys answered *that* . . . proving what we've been saying right along–that there's an Anaconda Copper Alloy available to do 'most *any* kind of job. And economically, too!

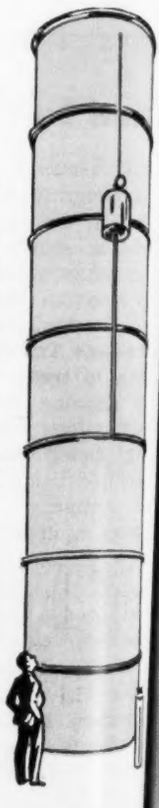
Twenty years–

That's not a sentence. It's a guarantee that goes with every automatic water heater sold by Bauer and Company of Hartford, Conn. One big reason why is that Everdur*, carbon-arc welded, is used for the non-rust tank. Coincidentally, twenty years ago the Bauer Company discovered the merits of this Copper-Silicon Alloy–strength, corrosion resistance, workability and weldability–and has been using it ever since for tanks ranging from 2½ to 150 gallons. Dependable stuff, that Everdur.

*REG. U.S. PAT. OFF.

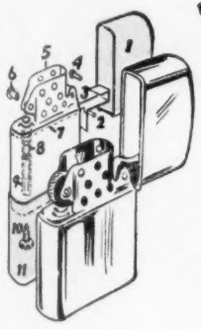
Schenley sets up a tall one

Ever wonder why copper has been used so long–and so diversely–in breweries and distilleries? The question is prompted by this three-story still, one of the many pieces of equipment made of copper in the new Canadian Schenley Limited distillery at Valleyfield, Quebec. The answer: Copper is readily worked into the unusual shapes and forms required; it provides high corrosion resistance, and never rusts to contaminate products; it's tops in rapid heat transfer; it can be readily and dependably joined by soldering, brazing, oxyacetylene welding, or by the newer carbon arc, inert-gas-shielded welding method. Most of the equipment for the Schenley plant was fabricated in Canada by Canadian-Vickers Limited of Montreal–of Anaconda Copper, of course.



P.S. If you are having difficulty in selecting a metal for a particular application, let us help you with it. Talking about it entails no obligation–and our vast experience places us in a position to come up with the right answer. Address The American Brass Company, Waterbury 20, Conn.

Metals at work



"No Zippo owner ever spent a cent for repairs"

That is the unqualified, unconditional guarantee held by millions of Zippo Lighter owners. How does Zippo do it? First, the design is excellent. Second, meticulous care is employed in manufacturing. And third, the right metals are used in the right places . . . metals that are easy to fabricate, economical to finish and that do their assigned jobs for years on end. You guessed it. Eleven components of the Zippo Lighter are made of Anaconda Brass and Nickel Silver Alloys in the form of strip, wire, rods and tubes.

We take our own medicine

And it's good! For years we've been extolling the merits of welding with Bronze. Then our subsidiary, the American Metal Hose Branch ran into a toughie—braze-welding the fittings on these 2½″ diameter Vibration Eliminators for refrigeration lines. The assembly includes a thin-wall flexible bronze tube, a rigid copper tube fitting, a copper ferrule, and—672 strands of .028″ bronze wire. Result: a strong, ductile, vibration-resistant weld, absolutely leakproof against the most searching refrigerants. Want a booklet on Anaconda Bronze Welding Rods? Ask for Publication B-13.

Stuffed with Copper

Ever since The American Brass Company developed a means of producing electrolytically deposited copper in practically unlimited lengths, new uses for this paper-thin metal pop up continuously. Most recent is the application of "Electro-Sheet" in Multi-Velocity Air Filters, made by Research Products Corp., Madison, Wis. The copper, slit and expanded, has important advantages over other materials: Light weight, high dirt-holding capacity, non-clogging and improved cleanability features; and lower restriction at all air velocities up to 550 feet per minute. Just in case you want to know, "Electro-Sheet" is available in thicknesses from .00068″ to .0094″, in widths up to 62″.

Look this way, please

Designed to sell at $14.95, the Beacon "225" Camera, produced by Whitehouse Products, Inc. of Brooklyn, N. Y., introduces a degree of precision befitting much more costly cameras. Handsomely styled, the Beacon "225" uses standard film and is inexpensive to operate. This policy of offering high-quality at low-cost has met with marked success, for more than 300,000 Beacon Cameras have been sold to date. Dozens of the intricately formed camera parts, made of copper base alloys, were produced by our Waterbury Brass Goods Branch—in large quantities, inexpensively, to unusually close tolerances in multiple die production. If you're interested in this type of work your sample, sketch or description will start the ball rolling.

Out of sight but not out of mind

Maybe you never gave a thought to those gas service lines that run from the main into the house. But you can bet your gas company does, for replacing rusted out steel services is a major item of maintenance expense. So . . . twelve years ago a large midwest utility started replacing gas service lines with copper tube—very often eliminating trenching by pulling the smaller 1″ or 1¼″ tube through the reamed-out steel pipeline. 25,000 replacements have been made by this one company alone, and—surprise—the total cost of a rust-free copper renewal is considerably less than that of a steel replacement!

ANACONDA

the name to remember in

COPPER, BRASS & BRONZE

High Temperature Refractories Discussed at Electrochemical Society Meeting

Recent developments in refractories that will withstand 4000° F temperatures and higher, how chromium improves oxidation resistance of titanium carbide, protective coatings for molybdenum, vapor deposition of refractory coatings, improved palladium plating bath, new heat resistant protective coatings, corrosion of composite plated coatings are among the subjects reported here

SIGNIFICANT developments in high temperature refractories, protective coatings for molybdenum, plating baths, corrosion of composite plated coatings were among the subjects discussed at the 97th Electrochemical Society meeting in Cleveland, earlier this year.

Refractories for 4000° F—Recent developments in refractories that will withstand temperatures of 4000° F (2200° C) or higher were reviewed before the electrothermic symposium by Gordon R. Finlay, Norton Co. Research Laboratories. Some of the most promising high temperature refractory materials are based on certain carbides, nitrides and borides.

The list of carbides which fall into this class of high temperature refractories is quite extensive. It includes TiC; ZrC; TaC; Ta_2C; WC; W_2C; MoC; Mo_2C; VC; and SiC. Among the nitrides, it was reported that only TiN, ZrN, and TaN have received much attention. Recent interest in the borides has been high. Composition of these tends to be variable but the ideal structures, in a number of cases, seem to correspond to diborides such as TiB_2, ZrB_2, and TaB_2, CrB_2, etc. Monoborides such as CrB have also been observed; the complex boride B_4C or $B_{12}C_3$ has long been known as the commercial product Norbide.

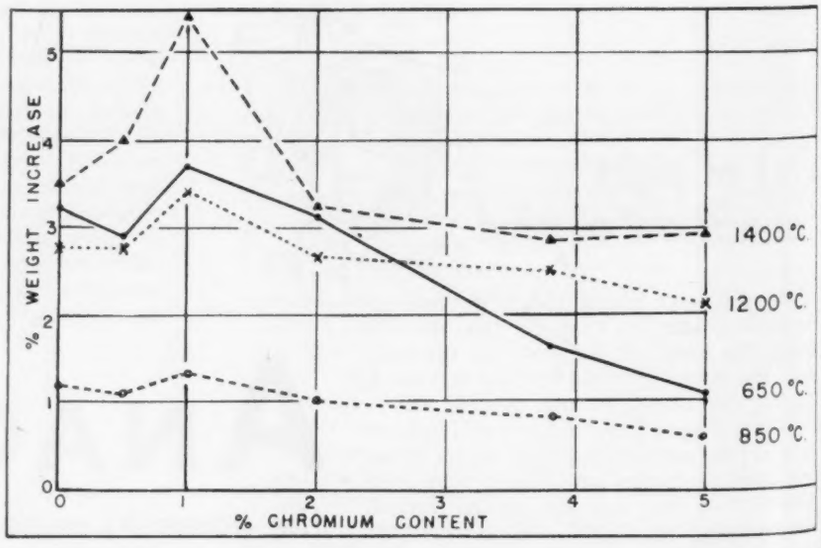
Properties Remarkable—Properties of a number of these materials are quite remarkable even aside from their high melting points. Almost all of the carbides, nitrides, and borides are good conductors of electricity. The poorest of the lot were reported by Finlay to be Norbide and silicon carbide. On the other hand, it was pointed out that some of the metal borides, such as ZrB_2, are better conductors than the corresponding pure metals and several of these borides, as well as some of the carbides, have resistivities of the order of a few microohm-cm.

It was pointed out that two exceptions to the general rule that these high melting materials are also hard, are boron nitride and graphite. Both of these materials have a layered structure which is responsible for their lubricating properties. Among the oxides, beryllia, magnesia, zirconia, thoria, calcia, and strontia have melting points in the high temperature range.

Fabricating Techniques Worked Out—Finlay stated that the Norton Co. has worked out techniques for fabricating Norbide (B_4C) to the shapes desired. This technique involves the hot pressing of a finely divided powder in an accurately machined graphite mold. This technique of hot pressing has since been applied to this whole group of refractories. It is very successful with the oxide and carbides.

In the case of the nitrides, there has been some absorption of carbon from the mold body. This can be partially alleviated by a very rapid molding cycle. This technique of fabrication involves some limitations on shape and relative dimensions, but the only limit on size is provided by the graphite mold available, or the pressing or heating capacity which can be utilized. The hot pressing method produces a body of low or negligible porosity with no channel pores. An alternative method involves cold pressing or ramming followed by a sintering process. This produces bodies of considerable porosity.

Applications Pointed Out—Possible applications for these materials, pointed out by Finlay include crucibles, jet nozzles, refractory liners, and arc or electrolytic electrodes. All of these materials must stand up well in neutral atmospheres or in vacua. For use in oxidizing atmospheres, only the oxides are to be recommended. In reducing atmospheres the oxides are not suitable but the carbides and nitrides are quite resistant. The unique properties of these materials would seem to indicate that further uses might be found for them, par-



Results of studies on addition of chromium to titanium carbide. Curves show variation of weight increase with chromium content on oxidation for one hour at temperature noted

ticularly as technically important temperatures continue to move to higher levels.

Chromium Improves Oxidation Resistance—Work conducted in the research laboratories, Titanium Alloy Manufacturing Division, National Lead Co., has shown that a small percentage of chromium in recrystallized titanium carbide improves the resistance of the material to oxidation at elevated temperatures. According to J. D. Roach, in reporting the results of studies on oxidation resistance at 650° C, 850° C, 1200° C, and 1400° C, the maximum resistance, at each temperature, was obtained with an addition of 5 per cent chromium. The amount of oxidation was determined by the increase in weight of specimens of different chromium content after heating in air at the various temperatures. Some of the results obtained are shown in the accompanying graph.

Gas Velocity 1500 Miles per Second—Roach brought out the fact that recent advances in jet propelled and turbo-jet engines have placed great emphasis on the need for materials applicable for use at high temperatures. The most important criterion for the successful application of a material at elevated temperatures are: (1) Strength; (2) stability, and (3) toughness, all at the temperature of service. In the case of jet engines, erosion as well as abrasion resistance is also very important. Gas velocity in the nozzle has been estimated at 1500 miles per second.

Another property of importance is the weight-strength ratio. One group of promising materials for this purpose are the hard compounds usually formed by powder metallurgical processes. One of these is titanium carbide, which, since it is extremely hard (9 on Mohs hardness scale) and refractory (melting point—3140° C.) might be expected to have good elevated temperature properties. Other effects of chromium on titanium carbide that were observed, in addition to the effect on oxidation resistance, were increased density and decrease in the amount of free carbon.

Protective Coating for Molybdenum—Work conducted at Battelle Memorial Institute in co-operation with the Fansteel Metallurgical Corp. has shown that molybdenum can be rendered highly corrosion resistant by treatment with a hydrogen-silicon tetrachloride atmosphere at 1000° to 1800° C so as to produce a molybdenus disilicide coating at its surface.

According to the report presented before the group of electrochemists, coatings, 1-mil thick, thus produced, have completely protected the base metal for over 4000 hours in air at 1000° C. and for over 30 hours at 1700° C. Thicker coatings, within limits, were stated to give proportionately longer lives. Although brittle at room temperatures, the coatings have limited ductility at red heat. The coatings also tend to be self healing.

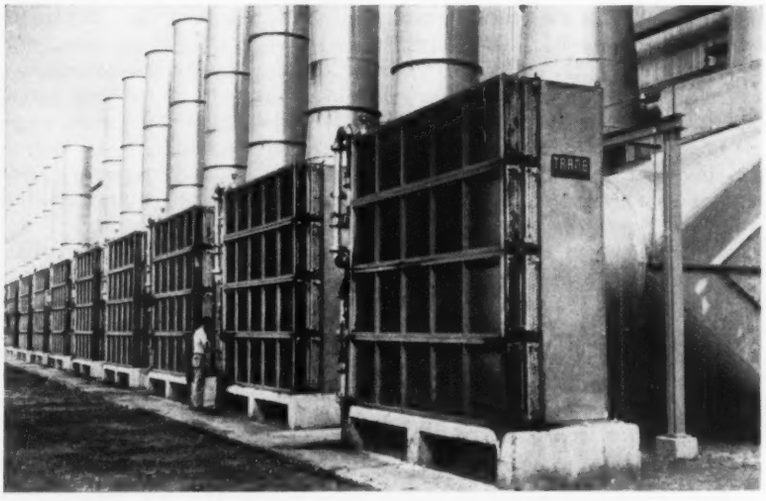
Vapor Deposition of Refractory Coatings—Several papers were presented based on work conducted in Battelle Memorial Institute laboratories on vapor deposition of refractory-type metals and their compounds. One such report stated that molybdenum and tungsten coatings are formed by hydrogen reduction of their chlorides. The platinum group metals are deposited by decomposition of the carbonyl chlorides.

Rhenium may be deposited by pyrolysis of its volatile chlorides, and uranium by thermal decomposition of the triiodide stabilized with iodine. The Battelle workers pointed out that by proper selection of reactions and plating conditions, alloys of most of the refractory metals can be obtained over wide ranges of compositions, thus making it possible to prepare alloys not obtained by conventional methods.

Vanadium Deposition Difficult—Additional work reported from the Battelle laboratories showed that tantalum and columbium coatings are readily deposited on both metallic and nonmetallic bases by hydrogen reduction of their pentachlorides at temperatures above 600° C. On refractory bases such as molybdenum, tungsten, and graphite, thermal decomposition of the pentachlorides and pentabromides may be used to produce coatings of these metals. Vanadium deposition was reported to be more difficult to carry out; however, satisfactory deposits of vanadium have been obtained by decomposing vanadium diiodide at 1000-1200° C. on the surface of the work.

It was also reported that coatings of the refractory nitrides, borides, and silicides can be obtained by the reaction of metal chlorides with N_2-H_2, BCl_2-H_2, and $SiCl_4-H_2$ atmospheres, at a heated surface under carefully controlled conditions. It was suggested that where difficulty is encountered in controlling the relative rates of deposition of metal and nonmetal, the metal may be deposited first and then nitrided, borided, or siliconized. Oxide coatings may also be obtained by the decomposition of or reaction of the metal halides under certain conditions.

Coatings of the refractory carbides are obtained on metallic or nonmetallic bases by reduction of metal chlorides in a hydrogen-hydro-



ANOTHER FIRST FOR TEXAS: A battery of 120 giant radiators comprises the cooling system for an equal number of Nordberg radial internal combustion engines, said to be the world's largest power plant of its type. Engines are used to drive the generators which furnish power for the Point Comfort plant of Aluminum Co. of America recently placed in operation in Lavaca, Tex. (see STEEL, July 3, p. 102). Made by Trane Co., La Crosse, Wis., the radiators are of the same type as found in your automobile, being used to cool engine cooling water and lubricating oil. Construction required 500,000 pounds of aluminum. Fifty-two freight cars were needed to haul the radiators

carbon atmosphere under carefully controlled conditions, or by deposition of the metal followed by carburization of the plate. In the case of coating a metal with its own carbide, heat treatment in a hydrocarbon-containing atmosphere is frequently satisfactory.

Improved Palladium Plating Bath—Recent work conducted in the International Nickel Co. laboratories and reported before the convention by E. M. Wise has resulted in a new palladium plating bath which is particularly useful for heavy deposits and electroforming. The process is based on the development of a high efficiency chloride bath from which heavy ductile deposits of palladium can be produced.

The bath is operated with soluble palladium anodes; it was stated to be practically self-maintaining since both anode and cathode efficiencies are high. Wise reported that heavy deposits from this bath will withstand annealing without blistering and will be ductile both before and after such annealing treatments. Maintenance of bath purity is an important point in its operation.

Heat Resistant Protective Coatings—Protective coatings that will withstand temperature above 800° F for extended periods of time were reported before the electrochemical convention. The coatings were stated to have excellent adhesive and corrosion resistant properties and are based on formulations developed in work recently conducted at the University of Louisville Institute of Industrial Research by R. A. Williams, I. H. Lutz, and W. H. Hayne, which was sponsored by the Navy Department, Bureau of Aeronautics.

One of the most promising coatings was a two-coat system, the primer coat of which consisted of a pigmented heat reactive phenolic vehicle, and the top coat being made up of a pigmented silicone or silicone-alkyd resin. It was reported that this coating was tested at 800° F for periods over 300 hours with no failure. In addition, the coating was heated in oil at 300° F for 10 hours and in toluene at 200° F for 5 hours with no harmful effects.

Primer Coat

1. *Composition*—5 parts by weight zinc, 1 part by weight aluminum, and 2 parts by weight cadmium dispersed in 30 parts of heat reactive phenolic varnish.
2. *Application*—Using the material as formulated, after thorough stirring, spray a uniform coat of approximately one mil thickness on solvent cleaned, emery polished or sand blasted surface.
3. *Baking schedule*—Bake the coated parts for not less than 30 minutes at 250° F minimum. No air drying is necessary. If the parts are air dryed an hour or more, the minimum baking temperature can be 200°F.

Finish Coat

1. *Composition*—6 aluminum, 10 silicone DC 802; 15 glyceryl phthalate (all parts by weight).
2. *Application*—In preparing the paint the required amount of glyceryl phthalate is added to the silicone-aluminum mixture, and the mixture stirred to a smooth consistency. For spray application, dilute with a small amount of toluene. Spray a smooth continuous film of this top coat over the primer. The film thickness of the top coat is critical and should be held within the limits of 0.5-0.7 mil.
3. *Baking Schedule*—The coated parts may or may not be air dried; In any case, they must be baked at 300° F for not less than 2 hours.
4. *Service*—The coating may be subjected immediately to the desired temperature of 800°F.

Another coating composition which has been applied as a single coat system to stainless steel and which has shown superior heat, weather and corrosion resistance has the following composition:

0.40 parts by weight cadmium powder
4.00 parts by weight ferro enamel blue oxide 3203
0.75 parts by weight ferro enamel green oxide 3630
2.75 parts by weight Drakenfeld black oxide
1.00 part by weight water ground mica
33.00 parts by weight silicone DC 802
0.53 part by weight lead naphthenate

Corrosion of Composite Plated Coatings—At the symposium on theoretical electrochemistry, J. E. Stareck, United Chromium Inc., pointed out that the maximum in performance of plated metals can only be attained by proper application of the principles of the corrosion cell. In this connection it was emphasized that there are four main factors in the corrosion cell itself which determine the type and rate of base metal corrosion.

As given by Dr. Stareck, these are: (1) Magnitude of the cell potential; (2) resistivity of the conducting medium or electrolyte; (3) degree of passivity of the respective metals; and (4) polarity of the base metal with respect to the coating.

It was further pointed out that the individual importance of these factors is determined primarily in (1) by the relative position of each metal or each alloy in the galvanic series; in (2) by the type and concentration of the electrolyte present in the pores; in (3) by the properties of the metal involved, and the conditions to which they are subjected; and in (4) by the proper choice and order of the composite metal coatings.

Rules Governing Corrosion Mechanism—Based on corrosion tests conducted in the United Chromium laboratories, Stareck presented some rules which appear to govern the mechanism of corrosion in single as well as composite type of plated coatings. When two or more composite metal coatings are applied to a basis metal, greatest inhibition of the latter is obtained in a given environment when the most noble of the applied metal coatings is directly beneath the outer surface metal. Cathodic protection by means of more noble metals is possible if the difference in potential between the most noble and the least noble of the applied metal coatings under the conditions of test is greater than the potential required of the base metal to prevent its corrosion in that same environment.

Also, when two or more composite metal coatings are applied, corrosion of the base metal is encouraged in a given environment whenever the most noble metal is applied on the outside surface.

Small, But Packs a Wallop!

CAPABLE of the rate of discharge of 5 amp up to 20 minutes is a rechargeable battery of less than 1 cubic inch volume weighing less than 1 ounce. Besides being spillproof, substantially shockproof and free from corrosive fumes, vapors and spray, the model No. A1-HR-1 battery, made by Yardney Electric Corp., New York, is of the silver cell type. An alkaline storage battery, it utilizes silver and zinc as active materials and is produced in a variety of models ranging in capacity from ½ to 40 ampere-hours.

A History of Apprenticeship

IN 1640, a Massachusetts youngster named Thomas Millard bound himself as an apprentice to a master to serve him diligently and cheerfully for 8 years. Now, 310 years later 150,000 employers are taking part in apprenticeship programs.

Entitled, "Apprenticeship — Past and Present" a booklet prepared by U. S. Department of Labor, Washington, D. C., reveals the antiquated training methods used by the early settlers, those in vogue during subsequent periods and details many present practices and procedures.

More Stainless Fittings

WITH the growing use of stainless steel tubing for fluid handling, Parker Appliance Co., Cleveland, is adding six additional stainless steel tube fittings as standard stock items. The company reports that a total of 58 shapes and sizes of type 316 stainless fittings are now available. Increasing demand is attributed largely to increasing use of stainless tubings in the fields of atomic energy, chemical and petroleum processing and in high pressure-high temperature boilers and turbines.

If you are looking for the most economical fastening device to give bolted assemblies on your product the most dependable, enduring performance, check these Reliance Spring Lock Washer advantages against any other fastening device you may be using or considering—

no other fastening device gives you all these advantages

RELIANCE SPRING LOCK WASHER ADVANTAGES	WHAT THEY MEAN TO YOU
Adequate Tension	Prevents nut from backing off threads. Compensates for looseness as a result of wear.
Helical Design Coil	Provides, through natural means, maximum reactive range and pressure — keeps bolted assemblies *tighter longer.*
Cold Drawn Spring Steel Section	Section design can be varied to meet the job requirements. Heavier and wider cross sections develop greater reactive pressure. Offers greater fatigue resistance than devices made from light-section flat rolled material.
Bearing Surface for Full Nut	Can be used with any standard or special nuts. Does not depend for security on single-thread engagement and can not be destroyed through over-tightening.
Perfect Hardened Thrust Bearing	Washers are free to rotate, permitting greater tightening torque and reducing to a minimum resistance to tightening from surface friction.
Full Thread Engagement	Direct reactive pressure is exerted between nut face and bolted surface—cannot damage threads.
Wide Variety of Uses	Can be used in any bolted assembly from a locomotive to the smallest scientific instrument.
Made From Various Types Of Metal	Reliance Spring Lock Washers are made from carbon, alloy and stainless steel, K-Monel, bronze and aluminum.
American Standards Association Specifications	Manufactured to the A.S.A. Specifications in all sizes — Reliance Rib, Positive Wood Spring, Springlox, Knolink, Wide Bearing and Double Coil types for special application.
Easy To Use	No special skill required—one piece construction —no parts to come loose or fail. No projections to injure user or damage materials.
Inexpensive	The lowest cost tension fastening device for its weight and combined features on the market.
Eaton-Reliance Manufactured	The Eaton-Reliance reputation and the experience of more than 35 years of spring lock washer manufacture guarantee a commercially-perfect product and assure customer satisfaction.

FOR LOWER ASSEMBLY COSTS use Eaton Springtites or Sems—special-design Reliance Spring Lock Washers pre-assembled on bolts or screws — speed assemblies, reduce inventory difficulties, cut costs. Write for Springtite bulletin.

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"Super Machining" Steels

(Continued from Page 62)

leaded open hearth steel is unusually free from surface seams, slivers and laps. Various thin walled section parts, frequently extremely difficult to produce from bessemer steels, have been produced from leaded open hearth steel with minimum of cracking. For these parts, the leaded open hearth offers not only the maximum of machinability but better cross sectional soundness and great potential saving through reduction of rejected machined parts.

Surface imperfections often are responsible for the difficulty in crimping, riveting and bending operations. Experience indicates leaded open hearth free machining screw stock to be superior to bessemer steels in these types of operations. This would appear to be in order when comparing an open hearth steel with a bessemer steel for soundness of structure.

Tensile strength, yield point and brinell hardness of leaded open hearth grades are somewhat lower than standard bessemer grades, but for most practical purposes compare favorably with the new improved free machining bessemer steels.

Responds to Carburizing—Another important factor to be considered for many parts is response of the steel to carburizing. Some screw machine parts are produced from bessemer steels and then carburized; many more would be machined from bessemer if it had a better response to carburizing. Laboratory tests and production runs indicate that case carburized leaded open hearth screw stock parts are superior to bessemer steels in this property and compare favorably with other open hearth resulphurized carburizing grades.

Other potential uses are indicated for this new steel. One manufacturer has adopted it to replace parts made from tubing and another has replaced a part previously produced by deep drawn stamping with leaded open hearth screw stock machined on automatic screw machines. These changes have resulted in lower production costs.

What is "Machinability"?—Machinability is a term used for indicating the relative ease or success with which a material may be cut to produce a satisfactory part. In commercial machining, objectives vary widely and machinability may be evaluated in terms of tool performance as represented by tool life per grind under given conditions; speed at which the material can be cut, under different conditions, while maintaining a given tool life; the force, energy or power required for the cutting; surface finish produced; or the dimensional accuracy maintained among like pieces under given conditions.

Values of machinability usually are comparative and represent behavior of the material under given conditions. The material, shape and size of the tool, size and shape of the cut, cutting fluid used and cutting speed must be held constant in order that the values may be directly comparative. Testing, therefore, to be reliable, must be extensive.

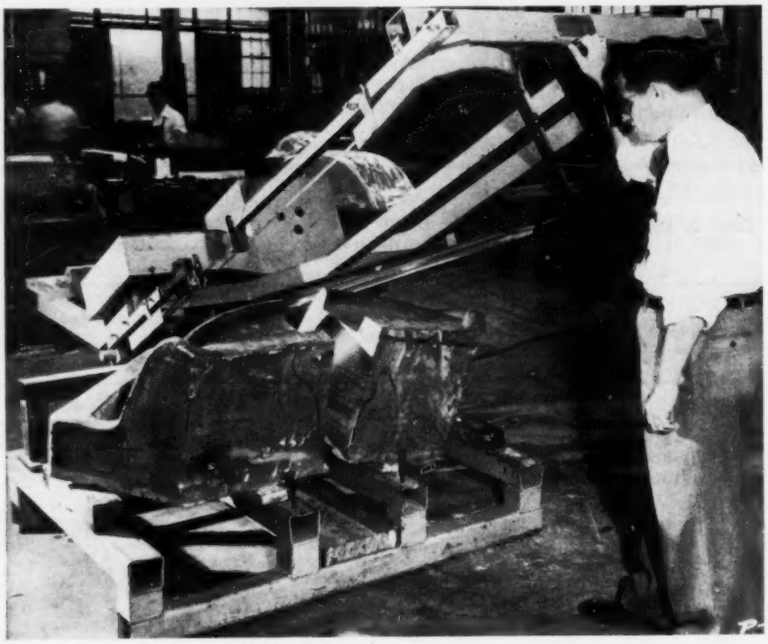
In the case of Jones & Laughlin's E steel, machinability evaluation was accomplished largely by production machining on automatic screw machines. In the development of MX steel of Carnegie-Illinois, extensive use was made of a specially developed constant-pressure lathe test (STEEL, Jan. 16, 1950, p. 80) for comparing machinability of different test heats of steel in order to evaluate effect of the variations in composition and in steelmaking practice employed.

Production Tests Correlate with Lab. Data—In extensive tests by this method, using samples from numerous production heats of both B-1113 and MX bessemer steel, the latter has shown an average index rating 45 per cent higher than the average for regular B-1113. Some individual heats have rated over 60 per cent higher than B-1113 average. Minimum index obtained on MX has been 25 per cent higher than the average for B-1113 steel.

Results of numerous trials and production tests on MX steel in fabrication of a variety of parts in many different screw machine departments have shown very close correlation with the results obtained in laboratory tests.

Carnegie-Illinois MX steels are cold finished and supplied to industry by a number of companies. One of these is Wyckoff Steel Co., Pittsburgh, which has plants at Ambridge, Pa., Chicago, Newark, N. J. and Putnam, Conn. Its trade designation for these steels is WXB (Wyckoff Special Bessemer). To be specific, its WXB-1 is MX B-1111 grade, WXB-2 is MX B-1112 grade and WXB-3 is MX B-1113 grade. Although these designations indicate the availability of the three grades, most of its tests have been conducted with WXB-3. Only in a few cases has WXB-2 been tested. This is in line with the fact that Carnegie-Illinois currently is confining its mill production of MX steel to the B-1113 grade.

Heat Treats Same as B-1113—It is



FOR DIE'S DYING DAYS: Instead of letting an unused die sit around while a way is figured to cut it into melting furnace size, Glenn L. Martin Co. of Baltimore, developed this band saw for cutting dies into pieces. Drop hammer dies weighing about 5 tons have been sawed in two in 55 minutes, it is reported. Any type of die, whether it be steel, zemak or lead, may be cut. Operating on the see-saw principle and easy to operate, it is operated by one person

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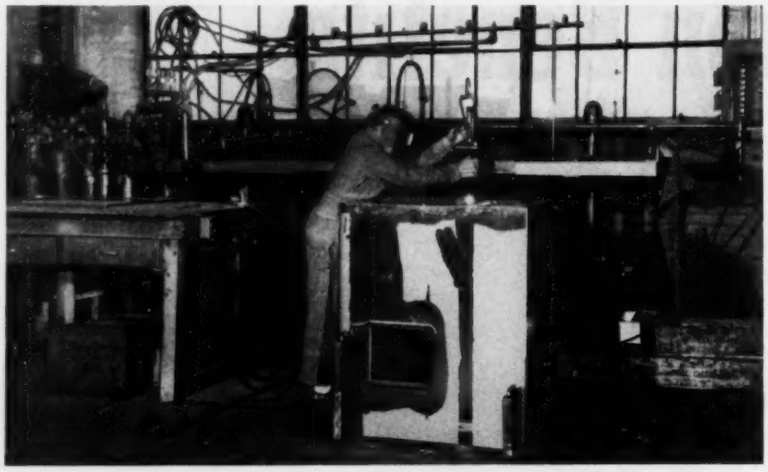

CHANGEOVER: Although built as a pantograph axyacetylene cutting machine, Peters-Dalton Inc., Detroit, transformed an Airco 6A Oxygraph, made by Air Reduction, New York, into a shape welding unit. The cutting torch was dismounted and replaced with a Heliweld machine holder for shape welding ends of a 16-gage type 304 stainless steel conveyor type dishwasher. To have the washer end at the correct height for welding, a pit was prepared into which units are lowered end down. Lifting and reversing the procedure allows welding of other end. Magnetic holding device makes possible welding speed of 35 inches per minute

the judgment of Wyckoff that WXB-3 will cyanide, carburize and respond to heat treatment exactly the same as regular B-1113. The company does not guarantee its performance in these operations any more than it does that of B-1113 because neither are killed steels. However, WXB-3 is being successfully treated in many plants.

Owing to the lower carbon content, WXB-3 is in general softer than the regular B-1113 and may run to 5000 psi lower in tensile strength than B-1113 but usually is somewhat the same as the latter. See Table I. WXB-3 is excellent for peening or crimping operations compared with B-1113. Furthermore, it is being roll threaded with excellent results. On the other hand, it will not weld any better than B-1113, this being due to the high sulphur content of both of these steels. Parts produced from WXB-3 are superior in finish to B-1113.

Machining Rate 120% Higher—From data Wyckoff has compiled on various tests, it is known that WXB-3 will machine at a rate 120 per cent or higher than for regular B-1113. The outstanding feature of WXB-3 is the longer tool life compared with B-1113. Wyckoff engineers believe that all parts made from standard B-1113 steel can be made from WXB-3 at a saving in machining costs which more than covers the increased material cost of about $3 per ton. WXB-3 has better transverse ductility and withstands cold working operations exceedingly well, but naturally not as well as the low carbon open hearth steels.

Table I gives a comparison of the physical properties of MX B-1113 (WXB-3) steel with standard B-1113. This indicates that there is no material difference in the strength of the two steels. It can be concluded that MX B-1113 can replace B-1113 without any loss of strength.

Fig. 1 shows two screw machine parts, one made from MX B-1113 steel, the other from standard B-1113. The one with the better finish, at the left, is the improved free machining bessemer. The B-1113 cut in 7 seconds with a tool life of 10 to 14 hours. The MX B-1113 cut in 5 seconds with a tool life of 16 to 20 hours. Gain in production is better than 30 per cent because of the faster time and longer tool life.

Pipe Thread Rolled—An interesting example of cost reduction was provided by a midwestern manufacturer recently. The part was a fitting for an automobile oil line, which when made of regular B-1113 required the pipe thread to be machined in a second operation. Substituting MX B-1113 steel, the job is now performed on a screw machine, eliminating the second operation by rolling the pipe thread. Neither feed nor speed of the machine was changed over those used on B-1113, but the company has gone from 70 per cent of gross production to 95 per cent. This is by virtue of better tool life. Tools last 32 hours. In addition, it has been able to roll a dry seal pipe thread with good die life on the screw machine.

Another cold finisher and supplier of Carnegie-Illinois MX improved free machining bessemer screw stock is Bliss & Laughlin Inc., Harvey, Ill., with mills at Harvey, Buffalo and Mansfield, Mass. Its experience indicates that varying according to the machine equipment available, tooling employed, and part being made MX steel has been machined at speeds up to 35 per cent higher than those used in cutting B-1113. Feeds and depth of cut have been increased up to 50 per cent, production rates have been raised up to 50 per cent, and tool life often has been more than doubled.

Tests Run in Job Shops—These tests, Bliss & Laughlin explains, were conducted by screw machine job shops and other manufacturers. Precaution was taken not to interject any variable other than material, so that results would give fair evaluation of the merits of the steel. In each instance MX steel was tested against regular B-1113 bessemer screw stock, which the shop had been using in production.

Machinability improvement provided by MX steel was judged on the basis of the increase in production rate which could be obtained without decrease in hours of tool life or sacrifice in part finish and dimensional tolerance. Production rate was upped either by increasing cutting speed or by increasing both cutting speed and feeds.

Using MX steel, production rates were increased from 18 to 55 per cent. While there was no increase in tool life as measured in hours, tool life based on the number of parts made before changing tools was advanced by the same percentage as was production rate. Improvement in tool life, although not evaluated, was sufficient to be a significant factor in reduction of general tool expense. It was observed generally that in all cases a smoother brighter finish was obtained. The free cutting character of MX was evidenced further by well broken chips and relatively cool parts.

No Panacea for All Machining Troubles—Bliss & Laughlin points out that for the majority of applications MX steel can be substituted satisfactorily for other free cutting bessemer steels since any slight differences in properties will be of little significance. While the new steel has demonstrated superior machining characteristics, it obviously is not a

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panacea for all machining problems. Its successful substitution for other free machining bessemer grades depends upon the extent to which its potential machinability can be utilized in fabrication of the particular parts under consideration, as judged by manufacturing costs.

Stud Production Up 33%—Jones & Laughlin reports that Automatic Voting Machine Corp., Jamestown, N. Y., has increased stud production an average 33 per cent through use of its E free-cutting bessemer screw stock. (STEEL, May 8, 1950, p. 89) Tool life on machines used in producing studs has been upped an average 25 per cent. There are more than 25,000 individual parts in an automatic voting machine, most of which are steel studs of one description or another. In all, more than 700 different types of studs are used with one type being used in more than 100 places on the same machine. Company formerly produced studs from standard B-1113; now has standardized on the E steel to improve production output and cut maintenance cost.

In addition, the superior cold forming properties of E steel have resulted in elimination of certain annealing operations. Some studs made of B-1113 for machinability had to be annealed before they could be riveted in position because they had a tendency to crack at the edges. Made of "E", the studs now are cold riveted smoothly and firmly in place without annealing and without cracking at the edges.

Machinability ratings based on B-1112 as 100 per cent have been accepted generally as a means for comparing the free cutting quality of steel. Ratings of the new E steel compared with conventional steels are as follows:

Per Cent Relative Cutting Speed			
E Steels		Conventional Steels	
Grade	Per Cent	Grade	Per Cent
E-15	110	B-1111	90
E-23	125	B-1112	100
E-33	170	B-1113	135

Tensile Properties Slightly Lower—The normal range of hot rolled and cold finished tensile properties for a 1-inch round is shown in Table II. It will be noted that yield point and tensile strength of E steel are slightly lower than for conventional bessemer screw steel, however, this difference is so small as to be not significant from an application standpoint. The new steel has been applied on more than a hundred different applications representative of conventional cold finished bessemer screw steel usage and in each case was fully satisfactory from the standpoint of mechanical properties.

A manufacturer of lubrication fittings substituting E-33 for conventional B-1113 at the regular 3-second cycle (2400 rpm—310 sfm) found rough-form tool life was 9 to 10 hours instead of 4 to 5 hours obtained with B-1113. On other tests, tool life was extended to 15 or 15½ hours.

A nutmaker used a 7-second cycle on a single-purpose nut machine at 1725 rpm for 9 hours with same tool. Production of 4860 nuts was more than 25 per cent greater than with regular B-1113 and finish was superior.

In a machining stud threaded at both ends, a company uses a 4-spindle National Acme automatic to form, face, chamfer, thread one end and cut off. Another machine threads other end. A short run was made at 1696 rpm and 168 sfm, but except for this machining was done at the usual 2½-second cycle of 1500 rpm and 147 sfm. Tool life increased 10 to 15 per cent and finish was 50 per cent better, particularly on threads.

Turret Lathe Cycle Time Cut—When E-23 steel was used for washing machine parts, speed of a Brown & Sharpe turret lathe was increased one-third over B-1112, reducing the time cycle from 67½ to 50 seconds. Tool life was three times as great. In an Acme Gridley automatic, speed was increased from 180 to 200 sfm.

Using E-33 for nuts, tool life on the drill and chamfer doubled. The parts cold formed up to twice the distance of those made from B-1113. In center drilling of bolts, an automatic screw machine running at 1706 rpm and 206 sfm gave better finish and less twist-off. Shafting of E steel shows excellent machinability in automatics. No difficulty is encountered in riveting one end and finish is pleasing. At 200 sfm and 0.0125-inch feed, tool life is increased two to four times in drilling and threading plumbing fittings. Manufacturer is able to tap a 1-inch full internal thread which was almost impossible on regular grade of bessemer screw stock.

La Salle Steel Co., Chicago, cold finishes and supplies both Carnegie-Illinois' MX B-1113 and Inland Steel's Ledloy under the tradenames Gold Tip B-1113 and La-Led, respectively. It reports there is a definite place for each of these new steels.

Economies Achieved in Various Ways—MX offers excellent opportunities to achieve production economies through a faster rate of machining and from longer tool life. Exact percentage of improvement varies from part to part and from shop to shop. Some users have reported increases in production as high as 50 per cent, and on an average have found that MX will give a 20 per cent increase in the number of finished parts in the pan at the end of a day's run.

Increased production is achieved in various ways. Some shops use the same setup for MX as for the standard B-1113 and obtain the increased production through longer tool life, reduced down time and increased operating efficiencies. Others maintain the same tool life, but increase their speeds or feeds, and in some cases both. Still others obtain greater production by reducing rejections on parts where finish is important or holding to size is a critical requirement.

MX Steel Softer—The lower carbon and silicon content is responsible for the MX steel being generally softer

DOWN TO THE STUB END: Replacing the sleeve adaptor commonly used on high speed drill presses is a new adaptor which makes possible the use of drill down to the shank, avoiding replacments and requiring only regrinding. Developed by Glenn L. Martin Co., Baltimore, Md., the adaptor leaves drill and chuck exposed and makes possible use of plexiglas shield through which operator views the operation. Air tube enters from rear of adaptor, spirals at the base, and returns to the rear, throwing the chips out in that direction. Chips do not accumulate inside the adaptor to clog the drill

and usually a few thousand pounds per square inch lower in tensile strength and yield point. For practical purposes, it is believed this will have no harmful effect on the finished part. In addition, MX is readily forgeable, has good ductility and responds reasonably well to cold working. The surface condition of the MX grade is at least comparable to standard B-1113 in freedom from surface defects, and, due to the longer tool life between grinds and the inherently better machinability, the machine part finish will be better for MX grade than for same part machined from standard B-1113 analysis.

No difference has been noticeable in response of MX to case carburizing, regardless of what method of carburizing is used. In addition, this new steel welds in much the same manner as standard B-1113.

Other Characteristics Maintained—Basically, the big advantage of MX steel is improved machinability obtained while maintaining other metallurgical characteristics comparing favorably with the old bessemer grades. In MX, as on all other grades of steel, there is some variation in the machining characteristics from heat to heat. However, on the average, MX will be definitely superior to the old standard B-1113.

Individual tests of one heat on one machine may not evaluate properly the overall shop economies which can be achieved as there always are various complicating factors present which affect the accuracy of any results other than those obtained by long-term overall production costs on a number of machines producing a variety of parts. Adoption of MX for parts now being produced from standard B-1113 should result in a lower finished part cost. It is felt that the increase of less than 3 per cent in steel cost can be more than offset by the overall production economies achieved.

On short runs, recommendation is that the machine setup used for standard B-1113 be maintained and that advantage be taken of the increased tool life and better finish that will be realized with MX. For long production jobs, some manufacturers prefer to modify their setups to take advantage of the increased speeds and feeds which can be developed with this steel. Usually these adjustments can be made in the automatic screw machine without expensive new camming arrangements and without altering present tools or cutting oils.

No Health Hazard—The free machining open hearth lead bearing steel contains approximately 0.25 per cent lead. This steel is said to present no health hazard in handling, machining, heat treating or ordinary forging. However, when it is to be welded, flame cut or heated to temperatures higher than 2000° F precautions should be taken against harmful concentrations of lead in the atmosphere. Manufacturer of the steel has available an instruction bulletin covering these precautions.

Figs. 2 and 3 and their accompanying tabular material show typical machining economy which can be achieved through use of Ledloy.

CALENDAR OF MEETINGS

† Denotes first listing in this column

Aug. 7-19, First U. S.-International Trade Fair: Coliseum, International Amphitheater and Navy Pier, Chicago. Fair headquarters are in Congress Hotel, Chicago.

Aug. 14-16, Society of Automotive Engineers: West coast meeting, Biltmore Hotel, Los Angeles. Society headquarters are located at 29 W. 39th St., New York 18.

Aug. 16-18, Third Western Packing and Materials Handling Exposition: Civic Auditorium, San Francisco. Additional information from Clapp & Poliak Inc., 341 Madison Ave., New York 17.

Sept. 5-9, American Chemical Society: National Chemical Exposition, Chicago Coliseum. Sponsored by Chicago Sections, ACS, 86 E. Randolph St., Chicago 1.

Sept. 11, Society of Automotive Engineers: Tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 11, Society of Automotive Engineers: Aeronautical meeting and aircraft engineering display, in Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Sept. 13-15, Porcelain Enamel Institute: Twelfth Annual Forum, University of Illinois, Urbana, Ill. Institute is located at 1010 Vermont Ave., N. W., Washington 5, D. C.

Sept. 13-16, National Association of Foremen: 27th annual convention, Statler Hotel, Buffalo, N. Y. Association headquarters: 321 W. First St., Dayton 2, O.

Sept. 18-22, Instrument Society of America: Instrument conference and exhibit, Memorial Auditorium, Buffalo, N. Y. Society headquarters are at 921 Ridge Ave., Pittsburgh 12.

Sept. 19-21, American Society of Mechanical Engineers: Fall meeting, Hotel Sheraton, Worcester, Mass. Society headquarters at 29 W. 39th St., New York 18.

† Sept. 23-26, Packaging Machinery Manufacturers Institute: 18th annual meeting, The Homestead, Hot Springs, Va., 342 Madison Ave., New York 17, is address of institute.

CARRY YOUR OWN: Having trouble testing by ultraviolet light because weldments, vessels or other parts are too large to move to a permanently-installed black-light booth? Menlo Research Laboratory, Menlo Park, Calif., has developed a portable and self-powered unit, the Fluoretor, which weighs less than 2 pounds. Standard flashlight batteries supply the power; a light-tight dark chamber excludes light from area being examined. Specimen-holding end caps permit examination of small objects. Magnification is 3X. Alternative generator-filter heads are available for operation at either 2537 or 3660 angstroms

If it's made of iron or steel, and exposed to the elements, remember to have it Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company
pittsburgh...pennsylvania

the world's largest job galvanizing plant

in the heart of the STEEL INDUSTRY

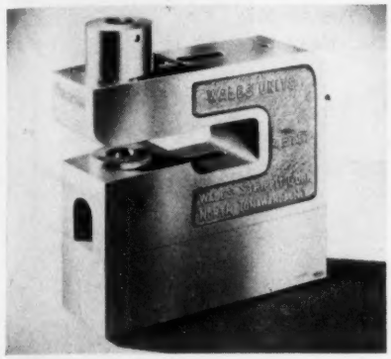
HOT DIP GALVANIZING

galvanizing....pickling....painting....oiling

New Products and Equipment

For Heavy Punching

Independent and self-contained, type G hole punching units, announced by Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y., are capable of punching holes in ½-inch thick mild steel. They are equipped with "split punches" which



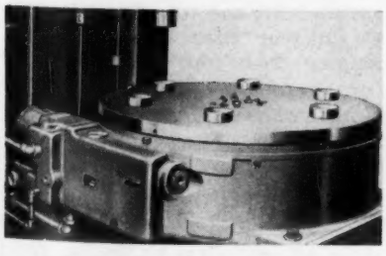
eliminate the high stripping pressures and oversize stripping springs formerly necessary.

Split punch assemblies, dies, guides and lifter springs are component parts designed into the holders. Units remain aligned for life. Once installed in the press, the only function of the ram is to depress the split punch assembly through the work. Setting up is a simple operation. Same groups of units may be set up on templates or T-slotted plates in stamping presses and on rails, strip templates or T-slots in press brakes.

Check No. 1 on Reply Card for more Details

Table Speeds Production

To make possible higher speed operations, automatic feeding and ejecting on production lines, Denison Engineering Co., 1160 Dublin Rd., Columbus 16, O., is making a 33-inch



automatic index table with 24-inch work circle. Unit may be used on either 35-ton Multipress made by the company or other makes of equipment. Hydraulically powered, it has variable speeds for any preselected indexing rate from 10 to 70 per minute. Accuracy is within plus or minus 0.002-inch.

When installed on the Multipress, it is powered by the pumping unit of the press through its control system. It may also be operated by a small auxiliary unit. Table is available in 6 and 12 station types. It operates from, and in positive sequence with, the action of the press ram through the control system of the hydraulic power unit.

Check No. 2 on Reply Card for more Details

Turret Punch Press

Cost of piercing, embossing or forming of parts in quantities less than 500 are reduced by the hand operated turret punch press developed by Diamond Machine Tool Co., 3425 E. Olympic Blvd., Los Angeles 23, Calif. Press has a 13-inch throat and contains 12 punches and dies, any of

which may be brought under the ram for immediate use by a twirl of the index handle.

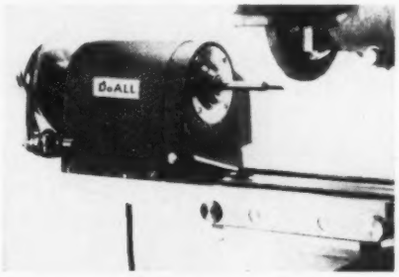
Capacity is 10 tons and maximum punch size is 1½-inches in ⅛-inch mild steel. Antibacklash gearing of turrets keeps punches in permanent alignment. Special punch was developed for this machine, permitting piercing of steel up to twice the punch diameter within the machine capacity.

Check No. 3 on Reply Card for more Details

Attachment Adds Versatility

A cylindrical grinding and indexing attachment for surface grinders, made by DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill., is designed to make such equipment more versatile. Work is held either in collets or on centers, capacity being 6½-inch swing and 7½-inch between centers. A built-in motor drives the spindle through step pulleys at speeds of 200, 400 and 700 rpm. Two-way sine-bar tilt arrangement makes it possible to grind tapers up to 45 degrees, either forward or rear.

Attachment has a 24-division index plate for rapid and accurate grinding of square or angular punches or other work. Unit is quickly mount-



ed or removed and is held by a magnetic chuck only. Long shafts up to ½-inch in diameter will pass through the spindle hole, being held in No. 3C collets. Step collets and blanks are available for larger sizes up to 3 inches.

Check No. 4 on Reply Card for more Details

For Power Stacking

Various materials may be moved at inclines up to 45 degrees by a cleated Rapid Power booster, developed for power stacking and boosting in limited space by Rapids-Standard Co. Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich. Easily rolled from one job to the next, the booster is made in 12, 16 and 20-foot lengths and 12, 16 and 20-inch belt widths. It has a box-channel bed of 10 gage steel, cross-braced and trussed to prevent deflection.

Bed is raised and lowered by hy-

draulic lift. Degree of incline is controlled by double screws, operated by a handwheel. Either a slider or wheel-type bed is available. Furnished as standard equipment are either adjustable tubular guard rails or per-

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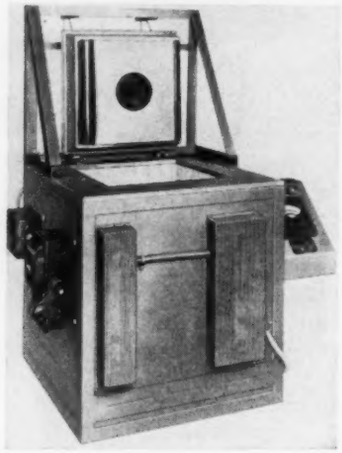
manently-mounted, nonadjustable angle steel models. Two floor locks hold equipment in place during operation. A welded sub-base which increases over-all height 18 inches is available.

Check No. 5 on Reply Card for more Details

Furnace Has Two Ranges

Two different temperature ranges are featured in the upright electric furnace for varied industrial application, made by K. H. Huppert Co., 6830 Cottage Grove Ave., Chicago 37, Ill. Adaptable for basket heating, steel hardening, or drying and



firing of ceramics, the furnace is available with an inside fan assembly for equalized temperatures up to 1250° F or with maximum temperature of 2000° F without recirculation.

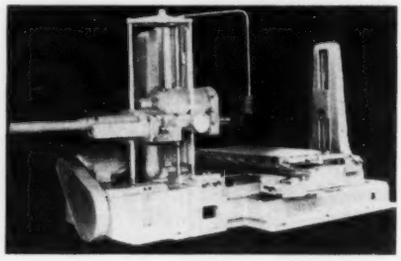
Coiled Kanthal heating elements are mounted in refractory plates and located on the four sides of the 21 x 21 x 30-inch heat chamber. Multi-insulation, a heat-resistant transite board top and asbestos seal recirculating door retains heat. A 292 Wheelco Capacitrol provides sensitive temperature control. All exposed metal parts within the furnace chamber are of stainless steel.

Check No. 6 on Reply Card for more Details

Boring Machine Redesigned

In redesigning the 3 and 4-inch spindle series of horizontal boring, drilling and milling machines made by Lucas Machine Division, New Britain Machine Co., Cleveland, O., bed has been extended to support the motor and speed and feed gear box. Number and size of control handles have been reduced and controls are color coded. Spindle is mounted on antifriction taper roller bearings and is driven at the high speed range by a vibration-free V-belt drive making possible use of carbide tools.

A large double gear mounted on the spindle sleeve, the drive for the two lower speed ranges, is out of mesh in the high speed range and acts as a flywheel to dampen out vibration. An automatic power posi-

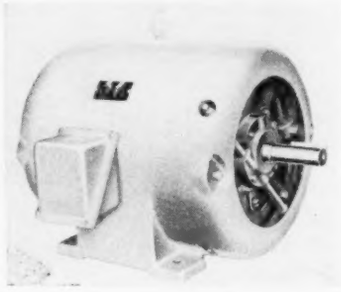


tioning control allows the operator to set up and run through a complete production job by inserting master rods and then through regular operating controls, get exact settings without hand adjustment for each subsequent operation.

Check No. 7 on Reply Card for more Details

Fan-Cooled Motor Line

Made with cast iron frame for installation where corrosion is a problem are totally enclosed fan-cooled motors offered in ratings from 5 to 250 hp by Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo. Offered in standard and explosion-proof designs, the motors have cast iron frames, endplates, blower shields,



conduit boxes and malleable iron corrosion resistant blowers.

Cartridge type ball bearings are prelubricated. Stator laminations are isolated from the air stream by the cast iron inner frame. A special varnish treatment after baking removes all moisture from the motor. The rotor squirrel cage is of aluminum cast under heavy pressure.

Check No. 8 on Reply Card for more Details

Hydraulic Straightener

H. K. Porter Inc., 74 Foley St., Somerville, Mass., is offering the Hydro-Midget hydraulic unit for pushing, spreading, lifting, bending or straightening operations. With chains, hooks, toes, rubber bases, etc., many special jobs may be performed.

The 3-ton capacity hydraulic jack is of the remote control type. Pump and reservoir are separate from the ram, but connected by high pressure, oil-proof rubber hose. Capacity rating is for direct push or pull; ratings on offset loads with attachments are somewhat less. Unit is fully portable.

Check No. 9 on Reply Card for more Details

Outdoor Handling No Strain

Developed for outdoor use over uneven terrain is a pneumatic-tired fork lift gas truck announced by Yale & Towne Mfg. Co., Philadelphia 15, Pa. Easy steering is provided by an

inclined king pin which also protects the steering gear against rock shock. All undercarriage operating and steering connections are cadmium plated to reduce damage from atmospheric rust and corrosion.

Named the Yard King, truck has an extra large radiator and cooling system. A Chrysler fluid-drive and clutch assembly minimizes wear on the clutch, starting slip taking place in the fluid coupling rather than in the clutch. Other features include automotive type controls, fully articulated rear axles, a hypoid drive at the rear axle and an hydraulically operated lift and tilt. Truck is available in four sizes having capacities ranging from 4000 to 8000 pounds. Overall collapsed mast-height is 85 inches, while stacking height is 118 to 124 inches, depending upon truck load capacity.

Check No. 10 on Reply Card for more Details

Variable Speed Drive Controls

Meeting the demand for quick-acting, automatic control of rotary motion is a line of automatic speed controls for P. I. V. variable speed drives, announced by Link-Belt Co., 307 N. Michigan Ave., Chicago 1.

- Sizes ½ to 6⅝ inches O.D.
- Wall Thickness .083 to 1.000 inches.
- Analyses—To Meet Conditions Where Heat, Corrosion, Pressure and Structural Strength are Involved.

Do the job best with the best tubing for the job—get

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ALLOY STEEL TUBES

SEAMLESS—MECHANICAL—PRESSURE

TYPICAL ANALYSES:

- Carbon Moly
- 1¼% Chrome ½% Moly .50/1.00
- 1¾% Chrome .60/.80 Moly
- 2% Chrome ½% Moly
- 2¼% Chrome .90/1.00% Moly
- 4/6% Chrome ½% Moly
- 6-8% Chrome ½% Moly
- 7-9% Chrome ½% Moly
- SAE 1335
- SAE 2300
- SAE 2512
- SAE 4130; SAE 4140
- SAE 4615
- SAE 8615, 8617 Fine Grain
- SAE 8620; 8630; 8635; 8640
- 5% Ni.
- 9% Ni.

TYPICAL APPLICATIONS:

- Superheat Tubes
- Pressure Tubes
- Still Tubes
- Mechanical Tubes
- Condenser Tubes
- Barrel Tubes
- Pump Barrels — Oil Well
- Evaporator Tubes
- Aircraft Tubes
- Propellers
- Rollers for Transmission Chains
- Oil Well Tubing

GLOBE TUBES

Globe engineers gladly give you the benefit of specialized knowledge and experience on the application of steel tubing in a wide range of services — mechanical — pressure — corrosion resistant.

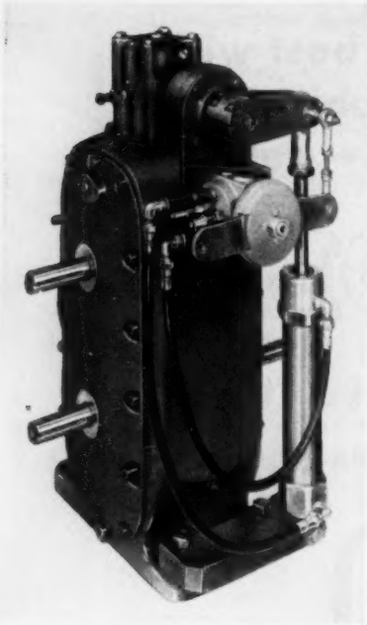
GLOBE STEEL TUBES CO., Milwaukee 4, Wis.

Chicago - Minneapolis - Cleveland - Detroit - New York - Philadelphia
St. Louis - Tulsa - Houston - Denver - San Francisco - Glendale, Calif.

Producers of Globe Seamless Stainless Steel Tubes — Gloweld Welded Stainless Steel Tubes — Carbon-Alloy-Seamless Steel Tubes — Globeiron Seamless High Purity Ingot Iron Tubes — Globe Welding Fittings.

Ill. Units are available in electronic, hydraulic, pneumatic and mechanical types. Actuation may be by floating rolls and follower rolls, floats and pressure diagrams, etc.

A wide choice of actuating devices and drives makes possible a wide variety of applications. Drives are



available with these automatic controls in eight sizes from 1 to 25 hp capacity, with speed ratios of 6 to 1 and 16 standard types including plain, motorized, single and double reduction geared units, for horizontal or vertical mounting.

Check No. 11 on Reply Card for more Details

500° F Heating Oven Line

Three standard types of batch ovens for industrial process heating operations of all kinds up to 500° F are being introduced by W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn. Bench model for tray loading is for drying glassware or small quantities of chemicals, organic finishes, etc. It is available with either gas or electric heating. Cabinet type, also gas or electric heated, for larger operations, is adaptable to either tray or batch loading. The truck oven is provided with special floor guide channels and is capable of handling large quantities. It is available with direct gas, indirect gas, direct oil, indirect oil, electric or steam heating.

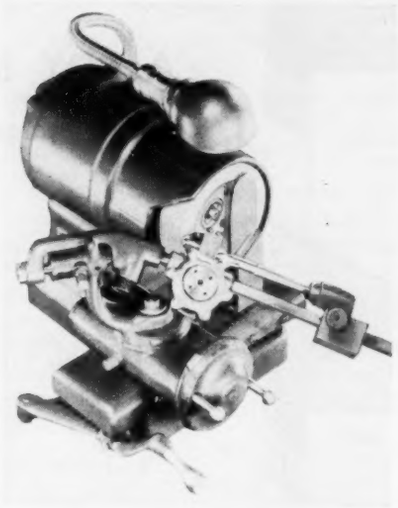
All of these Gehnrich ovens are constructed of heavy gage aluminized steel panels insulated with mineral or glass wool. Side swinging insulated doors are mounted on oversized hinges and equipped with explosion-proof latches. Fans effect uniform recirculation of heated air. Safety and temperature control equipment can be incorporated. All three types of ovens are available in different inside working areas.

Check No. 12 on Reply Card for more Details

Drills Accurately

Equipped with ball bearing slide, ball bearing swing frame and quick adjusting tail center is the No. 1G drill grinder manufactured by William Sellers Division, Consolidated Machine Tool Corp., Rochester, N. Y. The self-contained bench-type machine produces a drill point on one or any quantity of drills in sizes as small as 0.028-inch and up to ½-inch in diameter.

Theoretically correct drill lips are ground with the same inclination to



the drill's axis, of equal length and with proper clearance at both center and periphery. Additional capacity is obtained with a special attachment permitting grinding of drills from ½ to 1-inch diameter.

Check No. 13 on Reply Card for more Details

Sand Recovery System

National Engineering Co., 549 W. Washington Blvd., Chicago 6, Ill. is offering a sand decarbonizer, a batch unit operated by timer which continuously supplies reclaimed sand of physical characteristics equal or better than new sand. It operates successfully on oil, resin and cereal bonded sands. Used sand is charged into a bucket loader which starts the automatic cycle by dumping it into the reaction chamber.

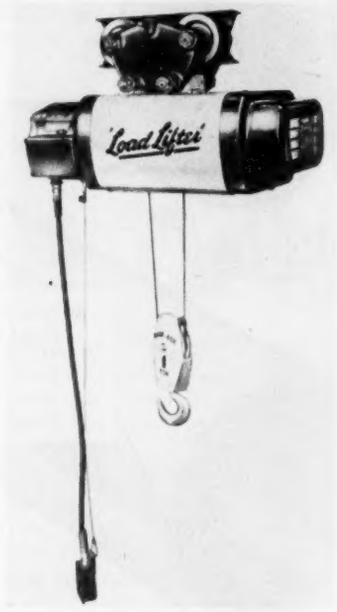
Permeation of air causes the sand to boil and carbonaceous materials are burned off and waste removed. After about 12 minutes, the sand is completely processed. Next it goes to a cooling chamber where air is forced through the sand, after which it is discharged for reuse by the foundry. Units of various capacities are available.

Check No. 14 on Reply Card for more Details

Electric Hoist Is Compact

Controlled by pushbuttons operating on 24 v for safety is the 1-ton capacity Load Lifter electric hoist designed by Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore Inc., Muskegon, Mich. Hoist is easily serviced in place without taking it down from its overhead support or track. Main frame is steel and housings and covers are aluminum alloy.

Motor brake is of the multiple disk type with friction disks operating in oil. Motor mounting will receive any standard make of motor with an NEMA flange mounting. Construction features large diameter deeply grooved drums with sheaves the same diameter as the drums, ball bearings throughout, helical gears with 20 de-



gree full depth cut teeth. Hoist is available for lug suspension, standard push geared type and motor driven trolleys and for all standard electric currents.

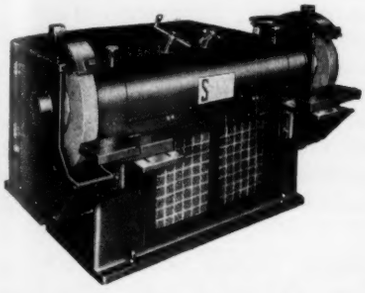
Check No. 15 on Reply Card for more Details

Regrinder for Efficiency

Operators of each end of the No. 55 twin-motor double end snagging grinder, made by Standard Electrical Tool Co., 2504 River Rd., Cincinnati 4, O., exercise complete control over their respective stations. Each may have its own type of grinding wheel, type of operation and speed. Each side has an individual motor with magnetic starter, start and stop push-button station, shaft lock for use when changing wheels and independ-

ent infinitely variable speed drive.

As the wheel reduces in diameter as little as 1/32-inch, turning of the crank handle simultaneously adjusts the guard for maximum protection

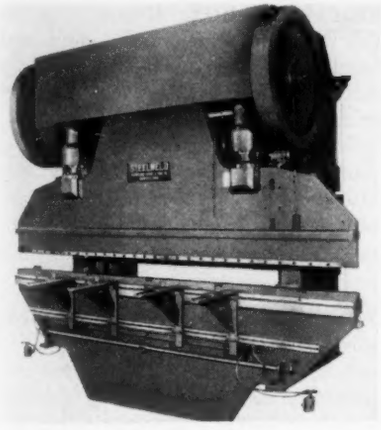


and increases spindle speed in direct relation to the worn wheel diameter. Each spindle is mounted on heavy duty ball bearings. A safety interlock prevents over-speeding.

Check No. 16 on Reply Card for more Details

Bending Capacity Is 500 Tons

The 500-ton bending capacity of the model MO6-12 Steelweld bending press, made by Cleveland Crane & Engineering Co., Wickliffe, O., will bend a ⅜-inch plate 20 feet 6 inchs



long. Machine is designed to take a special large gooseneck punch and for this reason has a shut height of 30 inches. Ram is provided with an extension which brings shut height down to 16 inches for use of standard dies when desired.

An extra-deep 18-inch throat permits unusual bending possibilities. Machine has a 6-inch stroke with two speeds of 7 or 20 strokes per minute. Clutch is air-operated and controlled by two foot-operated valves. A reverse flywheel permits ram reversal at any position of the stroke.

Check No. 17 on Reply Card for more Details

• • •

EMULSION CLEANER: Chemclean Products Corp., New York 13, N. Y., introduces a nontoxic solvent emul-

You profit by CLEVELAND'S policy of Specialization

Keeping "expert" in producing only Cap Screws, Set Screws and Milled Studs—plus "specials" made to customers' designs—is assurance that Cleveland's policy of Specialization brings you *Top Quality* Fasteners. We concentrate on making a *few* items *well*. . . . It's important, too, that by specializing we can make the much abused word "Service" really *mean* something. . . . It pays you to specify and buy Cleveland *Top Quality* Fasteners.

THE CLEVELAND CAP SCREW COMPANY
2917 East 79th Street, Cleveland 4, Ohio
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CLEVELAND *Top Quality* **FASTENERS**

ORIGINATORS OF THE KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

sion cleaner that has fast wetting, rapid pentrating and free rinsing properties. It is used as a pre-soak to remove impacted buffing compounds, drawing oils and compounds, sulphurized and chlorinated cutting oils, greases and soaps.

Check No. 18 on Reply Card for more Details

LIGHTWEIGHT CUTTER: Model W has been added to the line of Hydrashear wire rope cutters made by Pell Cable Cutter Co., San Francisco 5, Calif. It is designed for use with cable controlled equipment or wherever a small, portable, lightweight cutter is required. This model will cut any type and size of wire rope up to and including ¾-inch diameter.

Check No. 19 on Reply Card for more Details

FLANGE UNIT: Designated as FED series, a new ball bearing flange unit is available from Ahlberg Bearing Co., Chicago, Ill. Designed to meet requirements of small shaft equipment where light loads and normal speeds are imposed, it has an all metal, two bolt style housing. It has precision internal self-aligning ball bearings and labyrinth-type seal.

Check No. 20 on Reply Card for more Details

PICKLING CHAIN: A new Monel metal pickling chain is offered by S. G. Taylor Chain Co., Hammond, Ind. It is resistant to corrosion resulting from contact with sulphuric and hydrochloric acid solutions. Chain has a high tensile strength. It is recommended for use in salt water and in alkali and brine solutions.

Check No. 21 on Reply Card for more Details

PIERCES BLAST HOLES: Jet-piercing blowpipe, announced by Linde Air Products Co., New York 17, N. Y., can be held in the operator's hands and used for piercing blast holes in rock quarries. Holes for 1⅛-inch diameter dynamite can be quickly pierced to a depth of 5 feet in hard and abrasive rocks and ores.

Check No. 22 on Reply Card for more Details

OPEN-DROPOUT CUTOUTS: Two new 100 amp open-dropout cutouts with heavy duty interrupting ratings of 5000 amp are offered by General Electric Co.'s Transformer and Allied Product Divisions, Pittsfield, Mass. Units are available in 5.2 and 7.8 kv maximum ratings.

Check No. 23 on Reply Card for more Details

TWO-SPEED TRANSMISSION: A new model two-speed automatic transmission of 20 hp capacity, with minimum input speed of 900 rpm, is introduced by Western Mfg. Co., Detroit 10, Mich. Mechanism consists of two over-running clutches, one engaging in a clockwise and the other in a counter clockwise direction, so arranged that by reversing the motor two speeds are provided without changing direction of rotation of output shaft.

Check No. 24 on Reply Card for more Details

EXTENSION SCAFFOLDS: Over-Reach, developed by Atlas Industrial Corp., Brooklyn 32, N. Y., starts as a 6 foot ladder and extends to a height of 26 feet. It passes through doors and elevator openings easily. It has roller bearing swivel casters on all four legs. Outrigger provides extra stability.

Check No. 25 on Reply Card for more Details

THINS PAINTS: A new solvent and thinner for bituminous base paints and synthetic enamels is introduced by Speco Inc., Cleveland, O. It is a blend of aromatic, hydrocarbon solvents, specially compounded. It can also be used to remove bituminous base paints from surfaces before repainting.

Check No. 26 on Reply Card for more Details

EXHAUSTER FANS: Type AE exhausters, developed by Robinson Ventilating Co., Zelienople, Pa., are adapted for applications such as dust exhaust systems, smoke and fume exhaust systems and recirculating systems for heat treating furnaces and annealing ovens. Fans are available for belted or direct connected arrangements.

Check No. 27 on Reply Card for more Details

STAINLESS STEEL BELLOWS: Stainless steel bellows, made by Chicago Metal Hose Corp., Maywood, Ill., are available in a complete range of sizes. They are recommended where problems of pressure, high and low temperatures and corrosion are factors and are particularly suited for application of control devices and instrumentation.

Check No. 28 on Reply Card for more Details

COLLAPSIBLE BOX: Made of heavy gage steel with box corrugation design, the new collapsible, 2000 pound capacity materials handling box, available from Phillips Mine & Mill Supply Co., Pittsburgh 3, Pa., may be erected in less than 20 minutes. Designed for storing and transporting bulk materials and parts, it folds down to a height of only 9-1/16 inches with a perfectly level top surface. Construction is such that a fork lift truck or pallet truck may enter from all four sides. Each side is held in the upright position by a new type latch with a safety catch.

Check No. 29 on Reply Card for more Details

PACKLESS VALVES: National Research Corp., Cambridge, Mass., announces packless high vacuum valves designed especially for vacuum or other applications which require a very low rate of leakage. Available are 1, 1½, 2 and 3-inch valves of the globe screw and globe flange types.

Check No. 30 on Reply Card for more Details

DRILL PRESS FEED: Modernair Corp., Oakland 8, Calif., offers a new drill press feed that is installed on the spindle of a drill press. The single acting power unit permits controlled power operation. Due to a self-aligning feature, annular piston moves inside a fully enclosed annular cylinder so that unit floats on drill spindle directly over drill point. Controls may be for manual, semiautomatic or automatic sequence with simple three-way valve. Use of a foot pedal valve frees operator's both hands for handling work.

Check No. 31 on Reply Card for more Details

SKIP TOTE BOX: A new skip tote box with trunnions for convenient handling for fork truck or crane is announced by Palmer-Shile Co., Detroit 27, Mich. It is of corrugated all-steel construction with welded joint. The slanted box end for easy discharge is reinforced with steel braces.

Check No. 32 on Reply Card for more Details

TEMPERATURE CONTROLLER: Simplytrol, made by Assembly Products Inc., Chagrin Falls, O., is a temperature controller that is provided with automatic protection from thermocouple burn-out. It is a thermocouple millivoltmeter type controller with control action obtained by direct contact in the meter. No vacuum tubes or motors are used. Eight standard ranges cover temperatures from minus 75° F to 3000° F. All dials show both Fahrenheit and Centigrade.

Check No. 33 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

INTENSIFIED efforts of consumers to build steel inventories before government allocations apply are getting them nowhere. The mills, jammed with orders, are turning away tonnage left and right. They are moving slowly on future commitments pending clarification of defense program plans. Some producers' order acceptances do not go beyond October, a month that largely will be given over to handling third quarter carryover. Others are not booking even that far ahead. And the few mills that have set up schedules over remainder of the year on certain products warn revisions in quotas and deliveries may be necessary before autumn is far advanced. Special clauses are being inserted in contracts permitting cancellations and shipment delays in event national emergency priorities make such necessary.

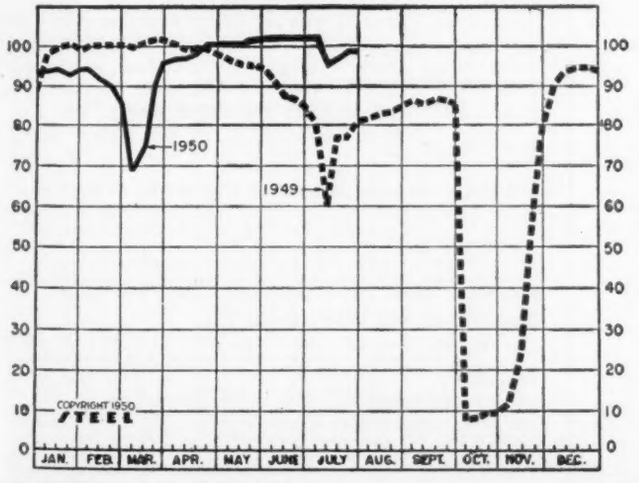
DEMAND—Activity in the market is not confined wholly to protective ordering. Many consumers urgently need supplies for current and near-future manufacturing operations. Expanding manufacturing schedules are calling for larger steel supplies. And many buyers have been unable to rebuild inventories depleted in last fall's steel strike. These consumers are turning in increasingly larger numbers to the high-cost conversion and gray markets. But even in these directions buyers are encountering difficulty. Not only is the clamor for tonnage in these markets as great as it is in regular channels, but conversion capacity is limited and only comparatively small tonnages are available from gray market sellers.

SUPPLY—Impact of new military demands is not expected to be noticeably heavier until fall. Armament and munitions orders are beginning to trickle through but it will be weeks before military releases come out in volume. Then it will take some time for armament production to get rolling at converted plants. Consequently, severe inroads into steel supply for civilian goods are not likely until late in the year at earliest. Even then, with production of steel pushed at capacity level, it seems a certainty tremendous tonnage will continue available for production of civilian goods. Current supply stringencies in sheets, strip, plates, and bars, and lately alloys and specialties, of course, will intensify in step with expanding armament needs. But this does not mean civilian supplies will be cut off completely. Present steelmaking capacity, exceeding 100 million tons of ingots annually, is more than sufficient to care for all probable military needs into the foreseeable future, as well as essential civilian requirements.

PRODUCTION—Steelmakers are pushing facilities to the limit to meet current demands. All signs now point to record-breaking production this year, probably in excess of 95 million tons, operations likely averaging close to 100 per cent. In the first six months, output of ingots totaled 47,106,141 net tons, largest for any six-month period in history. Capacity operations indefinitely into the future appear a certainty. Plans already are under way to reactivate idle steelmaking and rolling facilities, and plant modernization and expansion programs are being rushed to completion which will boost steelmaking capacity to 105,750,000 tons by 1953.

PRICES—Stability characterizes all sections of the steel market though one pig iron producer advanced prices $3 per ton. Elsewhere posted prices are unchanged. On finished steel, STEEL's weighted index holds at 156.69 while the arithmetical finished steel composite also holds at $94.36. While the composite for basic pig iron is unchanged at $45.97, that for No. 2 foundry advanced to $46.85 from $46.47, and that for malleable iron to $47.49 from $47.27. Scrap is showing signs of renewed strength though buying continues sluggish. Last week the steelmaking scrap price composite rose fractionally to $37.33 from $37.25 the week preceding.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended July 22	Change	Same Week 1949	Same Week 1948
Pittsburgh	99.5	+ 0.5*	77	90.5
Chicago	101	+ 0.5*	87.5	89
Eastern Pa.	97.5	+ 0.5	81	90
Youngstown	107	0	72	102
Wheeling	98.5	— 3	92	82.5
Cleveland	99.5	+ 2.5*	93.5	99
Buffalo	104	0	96	99
Birmingham	100	0	100	100
New England	92	+ 2	12	83
Cincinnati	106	+ 4	91	103
St. Louis	86.5	+ 3	75.5	78
Detroit	107	+ 2	106	98
Western	98	+ 3	76	..
Estimated national rate	99.5	+ 0.5	81	93

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.
* Change from revised rate.

Composite Market Averages

	July 27 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39) av.=100)	156.69	156.69	156.69	152.80	101.78
Index in cents per lb. ..	4.245	4.245	4.245	4.139	2.757
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.36	$94.36	$94.36	$91.82	$58.27
No. 2 Fdry. Pig Iron, GT	46.85	46.47	46.47	46.10	24.67
Basic Pig Iron, GT	45.97	45.97	45.97	45.60	24.00
Malleable Pig Iron, GT..	47.49	47.27	47.27	47.27	25.29
Steelmaking Scrap, GT..	37.33	37.25	37.50	19.34	19.17

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	July 27 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, C.F., Pittsburgh	4.10–15	4.10–15	4.10–15	3.95–4.00	2.65
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ..	3.60	3.60	3.60	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.60	3.60	3.60	3.50	2.25
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh...	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.25–50	3.25–50	3.25–50	3.25	2.10
Strip H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh ...	4.15–50	4.15–50	4.15–50	4.15–55	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–25	2.90
Wire, Basic, Pittsburgh ..	4.50	4.50	4.50	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30	5.30	5.30	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT)	58.00	58.00	58.00	67.00	36.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47-$50	$47.00	$47.00	$47.00	$25.00
Basic, Valley	46.00	46.00	46.00	46.00	24.50
Basic, del. Phila.	49.44	49.44	49.44	49.39	26.34
No. 2 Fdry, Pitts.	49.50	46.50	46.50	46.50	25.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	49.89	26.84
No. 2 Fdry, Birm.	42.38	42.38	42.38	39.38	21.38
No. 2 Fdry (Birm.)del.Cin.	49.08	49.08	49.08	45.43	25.06
Malleable, Valley	46.50	46.50	46.50	46.50	25.00
Malleable, Chicago	46.50	46.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn. ...	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

*Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts...	$41.00	$41.00	$41.00	$21.00	$20.00
No. 1 Heavy Melt. E. Pa..	33.00	33.00	34.00	17.50	18.75
No. 1 Heavy Melt. Chicago..	38.00	37.75	37.50	19.50	18.75
No. 1 Heavy Melt. Valley.	40.75	40.75	41.50	18.50	20.00
No. 1 Heavy Melt. Cleve..	38.50	38.50	39.50	15.00	19.50
No. 1 Heavy Melt. Buffalo	36.75	36.75	39.00	20.25	19.25
Rails, Rerolling, Chicago....	48.50	48.50	47.50	27.75	22.25
No. 1 Cast, Chicago	44.50	44.50	44.50	29.50	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	15.50	15.50	15.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.35

NONFERROUS METALS

Copper, del. Conn.....	22.50	22.50	22.50	17.625	12.00
Zinc, E. St. Louis	15.00	15.00	15.00	10.00	8.25
Lead, St. Louis	11.80	11.80	10.80	14.30–35	6.35
Tin, New York	97.75	91.00	78.25	103.00	52.00
Aluminum, del.	17.50	17.50	17.50	17.00	15.00
Antimony, Laredo, Tex. ..	24.50	24.50	24.50	38.50	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page. Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark,del.	50.63	51.13	51.63	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
AlabamaCity,Ala. R2	41.88	42.38	....	....
Birmingham R2	41.88	42.38	....	....
Birmingham S9	41.88	42.38	....	....
Woodward,Ala. W15	41.88	42.38	....	....
Cincinnati,del.	....	49.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y., W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y., T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester,N.Y.,del.	48.63	49.18	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W14, Y1	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.,del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron,del. from Cleve.	48.39	48.89	48.89	49.39
Lorain,O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Fontana,Calif. K1	52.00	52.50	....	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash.,del.	....	54.20	....	....
Portland,Oreg.,del.	....	54.20	....	....
LosAngeles,SanFrancisco,del. ...	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del. (incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
LoneStar,Tex. L6	41.50	*42.00	42.00	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	49.50	49.50	50.00
Pitts.N.&S. sides, Ambridge, Aliquippa,del.	....	50.69	50.69	51.19
McKeesRocks,del.	....	50.45	50.45	50.95
Lawrenceville,Homestead, McKeesport, Monaca,del.	....	50.94	50.94	51.44
Verona,del.	....	51.40	51.40	51.90
Brackenridge,del.	....	51.63	51.63	52.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	....	....	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y., R2	48.00	48.50	49.00	49.50
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson,O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2.	82.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged from silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.00
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL July 27, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicat e producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 ..... 51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer,Pa. C3 ..... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 ..... 58.00
Ensley,Ala. T2 ..... 53.00
Fairfield,Ala. T2 ..... 53.00
Fontana,Cal. K1 ..... 72.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 ..... 53.00
Lackawanna,N.Y. B2 ..... 53.00
Munhall, Pa. C3 ..... 53.00
So.Chicago,Ill. C3 ..... 53.00
So.Duquesne,Pa. C3 ..... 53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 ..... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3 ..... 65.00
Detroit R7 ..... 66.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 ..... 63.00
Fontana,Calif. K1 ..... 82.00
Gary,Ind. C3 ..... 63.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 ..... 71.00
Ind.Harbor,Ind. I-2 ..... 63.00
Johnstown,Pa. B2 ..... 63.00
Lackawanna,N.Y. B2 ..... 63.00
LosAngeles B3 ..... 82.00
Munhall,Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So.Chicago C3,R2,W14 ..... 63.00
So.Duquesne,Pa. C3 ..... 63.00
So.SanFrancisco B3 ..... 82.00

Alloy (NT)
Bethlehem,Pa. B2 ..... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2, T7 ..... 66.00
Conshohocken,Pa. A3 ..... 68.00
Detroit R7 ..... 66.00
Fontana,Calif. K1 ..... 85.00
Gary,Ind. C3 ..... 66.00
Houston,Tex. S5 ..... 74.00
Ind.Harbor,Ind. Y1 ..... 66.00
Johnstown,Pa. B2 ..... 66.00
Lackawanna,N.Y. B2 ..... 66.00
LosAngeles B3 ..... 86.00
Massillon,O. R2 ..... 66.00
Midland,Pa. C18 ..... 66.00
Munhall,Pa. C3 ..... 66.00
Sharon,Pa. S3 ..... 66.00
So.Chicago C3,R2,W14 ..... 66.00
So.Duquesne,Pa. C3 ..... 66.00
Warren,O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Gary,Ind. C3 ..... 76.00
Ind.Harbor,Ind. I-2 ..... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 ..... 76.00
So.Duquesne,Pa. C3 ..... 76.00

SKELP
Aliquippa,Pa. J5 ..... 3.25
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 ..... 3.15

WIRE RODS
AlabamaCity,Ala. R2 ..... 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala. T2 ..... 3.85
Houston,Tex. S5 ..... 4.25
Ind.Harbor,Ind. Y1 ..... 3.85
Johnstown,Pa. B2 ..... 3.85
Joliet,Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa,Colo. C10 ..... 4.10
Monessen,Pa. P7 ..... 3.85
No.Tonawanda,N.Y. B11 ..... 3.85
Pittsburg,Calif. C11 ..... 4.50
Portsmouth,O. P13 ..... 3.85
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 ..... 3.85
SparrowsPoint,Md. B2 ..... 3.95
Sterling,Ill.(1) N15 ..... 3.85
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 ..... 4.65
Worcester A7 ..... 4.15

BEARING PILES
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..... 3.40
Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 ..... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala T2 ..... 3.40
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston, Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 ..... 3.40
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 ..... 4.00
Lackawanna,N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 ..... 3.75
Munhall,Pa. C3 ..... 3.40
Niles,Calif.(22) P1 ..... 4.02
Phoenixville,Pa. P4 ..... 3.45
Portland,Oreg. O4 ..... 4.05
Seattle B3 ..... 4.05
So.Chicago,Ill. C3, W14 ..... 3.40
So.SanFrancisco B3 ..... 3.95
Torrance,Calif. C11 ..... 4.00
Weirton,W.Va. W6 ..... 3.40

Alloy Stand. Shapes
Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2 ..... 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 ..... 5.75
Gary,Ind. C3 ..... 5.15
Geneva,Utah G1 ..... 5.10
Ind.Harbor,Ind. I-2, Y1 ..... 5.15
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y.(14) B2 ..... 5.20
LosAngeles B3 ..... 5.75
Munhall,Pa. C3 ..... 5.15
So.Chicago,Ill. C3 ..... 5.15
So.SanFrancisco B3 ..... 5.70
Struthers,O. Y1 ..... 5.15

Wide Flange
Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 ..... 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 ..... 5.20
Munhall,Pa. C3 ..... 5.10
So.Chicago,Ill. C3 ..... 5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ..... 4.20
Lackawanna,N.Y. B2 ..... 4.20
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 ..... 4.20
Weirton,W.Va. W6 ..... 4.20

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 ..... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken,Pa. A3 ..... 5.35
Ecorse,Mich. G5 ..... 5.60
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 ..... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Ind.Harbor,Ind. I-2, Y1 ..... 5.35
Johnstown,Pa. B2 ..... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.35
So.Chicago,Ill. C3 ..... 5.35
SparrowsPoint,Md. B2 ..... 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ..... 4.50
Coatesville,Pa. L7 ..... 4.50
Conshohocken,Pa. A3 ..... 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 ..... 4.40
SparrowsPoint,Md. B2 ..... 4.40

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 ..... 4.55
Harrisburg,Pa. C5 ..... 4.55
Ind.Harbor,Ind. I-2 ..... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 ..... 4.55

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ..... 3.75
Ashland,lcl(15) A10 ..... 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.cl R2 ..... 4.10

PLATES, Wrought Iron
Economy,Pa. B14 ..... 7.85

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 ..... 3.50
Bessemer,Ala. T2 ..... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 ..... 3.60
Cleveland J5, R2 ..... 3.50
Coatesville,Pa. L7 ..... 3.60
Conshohocken,Pa. A3 ..... 3.60
Ecorse,Mich. G5 ..... 3.75
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.50
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 ..... 3.85
Houston,Tex. S5 ..... 3.90
Ind.Harbor,Ind. I-2,Y1. 3.50
Johnstown,Pa. B2 ..... 3.50
Lackawanna,N.Y. B2 ..... 3.50
Minnequa,Colo. C10 ..... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa.S3 ..... 3.50
So.Chicago,Ill. C3, W14 ..... 3.50
SparrowsPoint,Md. B2 ..... 3.50
Steubenville,O. W10 ..... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 ..... 3.50
Youngstown C3, R2, Y1. 3.50

PLATES (Universal Mill)
Fontana,Calif. K1 ..... 4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 ..... 5.25

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..... 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill.(1) L1 ..... 3.45
Atlanta,Ga. A11 ..... 3.60
Bessemer,Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryville,Calif. J7 ..... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1. 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 ..... 4.05
Lackawanna,N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 ..... 3.85
Niles,Calif. P1 ..... 4.17
N.Tonawanda,N.Y. B11. 3.45
Pittsburg,Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
Seattle B3, N14 ..... 4.20
So.Chicago C3, R2, W14. 3.45
So.Duquesne,Pa. C3 ..... 3.45
S.SanFran.,Cal. B3 ..... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 ..... 4.15
Weirton,W.Va. W6 ..... 3.45
Youngstown C3, R2 ..... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 ..... 3.45
Niles,Calif. P1 ..... 4.17
Pittsburgh(23) J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SanFrancisco S7 ..... 4.00
Weirton,W.Va. W6 ..... 3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2, T7 ..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.35
Ind.Harbor,Ind. I-2, Y1. 3.95
Johnstown,Pa. B2 ..... 3.95
KansasCity,Mo. S5 ..... 4.55
Lackawanna,N.Y. B2 ..... 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2, W14. 3.95
So.Duquesne,Pa. C3 ..... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.20
Altanta A11 ..... 5.35
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.40
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 ..... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. I-2, Y1. 5.20
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 ..... 5.20
LosAngeles B3 ..... 5.90
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 ..... 5.20
So.SanFrancisco B3 ..... 5.95
Struthers,O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 ..... 4.15
BeaverFalls,Pa. M12,R2. 4.15
Buffalo B5 ..... 4.15
Camden,N.J. P13 ..... 4.60
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 ..... 4.15
Detroit P17 ..... 4.30
Donora,Pa. A7 ..... 4.15
Ecorse,Mich. G5 ..... 4.35
Elyria,O. W8 ..... 4.15
FranklinPark,Ill. N5 ..... 4.15
Gary,Ind. R2 ..... 4.15
Hammond,Ind. L2, M13. 4.15
Hartford,Conn. R2 ..... 4.55
Harvey,Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 ..... 4.55
Massillon,O. R2, R8 ..... 4.15
Midland,Pa. C18 ..... 4.15
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 ..... 4.40
Pittsburgh J5 ..... 4.10
Putnam,Conn. W18 ..... 4.55
Readville,Mass. C14 ..... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill. W14 ..... 4.15
SpringCity,Pa.(5) K3 ..... 4.55
Struthers,O. Y1 ..... 4.15
Waukegan,Ill. A7 ..... 4.15
Youngstown F3, Y1 ..... 4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 ..... 4.90
Ambridge,Pa. W18 ..... 4.90
BeaverFalls,Pa. M12 ..... 4.90
Bethlehem,Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton,O. R2, T7 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora,Pa. A7 ..... 4.90
Elyria,O. W8 ..... 4.90
Gary,Ind. R2 ..... 4.90
Hammond,Ind. L2, M13. 4.90
Hartford,Conn. R2 ..... 5.20
Harvey,Ill. B5 ..... 4.90
Lackawanna,N.Y. B2 ..... 4.90
Mansfield,Mass. B5 ..... 5.20
Massillon,O. R2, R8 ..... 4.90
Midland,Pa. C18 ..... 4.90
Monaca,Pa. S17 ..... 4.90
Newark,N.J. W18 ..... 5.20
Plymouth,Mich. P5 ..... 5.10
So.Chicago,Ill. R2, W14. 4.90
Struthers,O. Y1 ..... 4.90
Warren,O. C17 ..... 4.90
Waukegan,Ill. A7 ..... 4.90
Worcester,Mass. A7 ..... 5.20
Youngstown F3, Y1 ..... 4.90

RAIL STEEL BARS
ChicagoHts. (3) C2, I-2. 3.30
ChicagoHts. (4) C2, I-2. 3.45
Dallas,Tex.(4) S20 ..... 6.00
Franklin,Pa.(3, 4) F5 ..... 3.45
FortWorth,Tex.(26) T4 ..... 4.18
Huntngtn,W.Va.(3) W7 ..... 3.45
Marion,O. (3) P11 ..... 3.45
Moline,Ill.(3) R2 ..... 3.40
SouthAvis,Pa.(2) J8 ..... 3.45
Williamsport(3) S19 ..... 3.70

BARS, Wrought Iron
Economy,Pa.(S.R.) B14. 8.60
Economy,Pa.(D.R.)B14 11.00
Economy(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1..12.25
McK.Rks.(S.R.) L5 ..... 8.60
McK.Rks.(D.R.) L5 ..... 11.25
McK.Rks.(Staybolt) L5. 12.75

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..... 3.45
Alton,Ill.(6) L1 ..... 3.45
Atlanta A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 ..... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1. 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 ..... 4.05
Lackawanna,N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 ..... 4.25
Niles,Calif. P1 ..... 4.17
Pittsburgh,Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SandSprings,Okla. S5 ..... 4.35
Seattle,Wash. B3, N14 ..... 4.20
SouthAvis,Pa. J8 ..... 3.45
So.Chicago,Ill. R2 ..... 3.45
So.Duquesne,Pa. C3 ..... 3.45
So.SanFrancisco B3 ..... 4.20
SparrowsPoint,Md. B2 ..... 3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 ..... 4.15
Youngstown C3, R2 ..... 3.45

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ..... 4.50
Johnstown, ¼-1" B2 ..... 4.35
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.40
Seattle B3, N14 ..... 5.10
SouthAvis,Pa. J8 ..... 4.35
So.SanFrancisco B3 ..... 5.00
SparrowsPt., ¼-1" B2 ..... 4.35
Williamsport,Pa. S19 ..... 4.35

SHEET, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..... 3.35
Ashland,Ky.(8) A10 ..... 3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 ..... 3.45
Detroit M1 ..... 4.15
Ecorse,Mich.(8) G5 ..... 3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.25
Gary,Ind. C3 ..... 3.35
Ind.Harbor,Ind. I-2, Y1. 3.35
Irvin,Pa. C3 ..... 3.35
Lackawanna,N.Y. B2 ..... 3.35
Munhall,Pa. C3 ..... 3.35
Pittsburg,Calif. C11 ..... 4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. W14 ..... 3.35
SparrowsPoint,Md. B2 ..... 3.35
Steubenville,O. W10 ..... 3.35
Torrance,Calif. C11 ..... 4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 ..... 3.35
Youngstown C3, Y1 ..... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..... 4.50
Dover,O. R1 ..... 4.65
Ind.Harbor,Ind. I-2 ..... 4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 4.10
Torrance,Calif. C11 ..... 5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken,Pa. A3 ..... 5.05
Ecorse,Mich. G5 ..... 5.26
Fairfield,Ala. T2 ..... 5.05
Fontana,Calif. K1 ..... 6.74
Gary,Ind. C3 ..... 5.05
Ind.Harbor,Ind. I-2, Y1. 5.05
Irvin,Pa. C3 ..... 5.05
Lackawanna(35) B2 ..... 5.05
Pittsburgh J5 ..... 5.05
Sharon,Pa. S3 ..... 5.05
So.Chicago,Ill. C3 ..... 5.05
SparrowsPoint(36) B2 ..... 5.05
Warren,O. R2 ..... 5.05
Weirton,W.Va. W6 ..... 5.05
Youngstown, C3, Y1 ..... 5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.40
Fontana,Calif. K1 ..... 7.06
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2, Y1. 6.20
Irvin,Pa. C3 ..... 6.20
Lackawanna(37) B2 ..... 6.20
Pittsburgh J5 ..... 6.20
SparrowsPoint(38) B2. 6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 ..... 6.20
Youngstown Y1 ..... 6.20

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SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED STOCK, 29 Ga.

Yorkville,O. W10	6.00

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron	An'ld	Galv.
Apollo,Pa. B14	12.00	15.50

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)	...	...	6.90	8.15	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.20	6.70	...	...
Parkersburg F4 (cut lengths)	...	...	...	...	8.75
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Parkersburg F4 (cut lengths)	9.30	....	....	....
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary, C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	4.95
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.50
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.50
Conshohocken,Pa. A3	3.35
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.50
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.50
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.50
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.85	8.80	....
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	....
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	....
NewCastle,Pa. E5	4.50	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.50	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4.50
Berea,O. C7	4.60
Bridgeprt,Conn.(10) S15	4.50
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	4.75
Detroit M1	4.95
Dover,O.(40) G6	4.50
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.50
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.50
NewCastle,Pa. B4	4.50
NewCastle,Pa.(40) E5	4.50
NewHaven,Conn. D2	5.00
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) N8	5.00
Riverdale,Ill. A1	4.30
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.50
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.50
Warren,O. R2	4.50
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Bufffalo Bolt Co.
B14 A. M. Byers Co.
C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Son, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
B1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H4 Heppenstall Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
J1 Jackson Iron & Steel Co
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.40
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	3.65
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Milbury,Mass(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. M8	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7, P16	5.35
Pawtucket,R.I.(12) N8	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. M8	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7,T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. M8	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark, 6-8ga. I-1	5.15
No.Tonawanda B11	4.50
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester, Mass. A7	4.80
Worcester,Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P7, P16	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. M8	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy.Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdvil. M8	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill. K4	126
Crawfordsville M8	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint, Md. B2	128
Sterling,Ill.(1) N15	126

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	116
Duluth A7	116
Franklin,Pa. F5	116
Huntington,W.Va. W7	116
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Marion,O. P11	116
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	120

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. M8	118
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity, Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill. N15	116

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

AXLES

Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

NAILS & STAPLES, Stock To Dealers & Mfrs. (7) Col.

AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. M8	108
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106
Torrance, Calif. C11	126
Worcester, Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. M8	5.45
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	3.75

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron&Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P 17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan.Crucible Steel Co
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

(1) Chicago base
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) 3" & wider; over ¼" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base
(22) Del. San Fran. Bay area.
(24) Deduct 0.35c for finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill shipments; to consumers, 4.93c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.75c. 0.035" and heavier.

UNIVERSITY OF MICHIGAN LIBRARIES

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	33.5	5.5	3.5	5.5
¼	6.0	0.42	33.5	31.5	30.5	5.5	3.5	6.5
⅜	6.00	0.57	29.0	27.0	26.0	0.5	+1.5	2.5
½	8.5	0.85	40.5	38.5	39.5	21.0	19.0	20.0
¾	11.5	1.13	43.5	41.5	42.5	25.0	23.0	24.0
1	17.0	1.68	46.0	44.0	45.0	28.0	26.0	27.0
1¼	23.0	2.28	46.5	44.5	45.5	28.5	26.5	27.5
1½	27.5	2.73	47.0	45.0	46.0	29.0	27.0	28.0
2	37.0	3.68	47.5	45.5	46.5	29.5	27.5	28.5
2½	58.5	5.82	48.0	46.0	47.0	30.0	28.0	29.0
3	76.5	7.62	48.0	46.0	47.0	30.0	28.0	29.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Etna, Pa. N2; Monaca, Pa. quotes 1 pt lower on ½" through 3", P9; Sharon, Pa. M6, quotes 1 pt lower on ¼", 1 pt higher on ⅜" and 1 pt lower on ½" through 3"; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., W10 except 3½ pts lower on ¼", 2½ pts lower on ¼", 3 pts lower on ⅜" Wheatland, Pa., except 2 pts lower on ⅛", ¼" and ⅜"; W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 24.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 8 pts lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, N3; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10% Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Copper Base Both Sides
302	....	....	....	19.75	21.50–24.00	75.00
304	22.50	26.50	....	20.75	22.50–25.5	77.00
305	....	....	....	....	....	79.00
309	28.00	32.00	....	....	....	....
310	34.00	38.00	....	....	....	105.00
316	27.00	31.00	....	26.00	28.00–33.5	....
317	32.00	36.00	....	....	....	....
318	31.00	35.00	....	....	....	....
321	24.00	28.00	....	23.00	25.00	90.00
347	25.00	29.00	....	24.00	26.00–31.5	94.00
405	18.75	24.75	....	....	....	....
410	18.25	24.25	....	....	....	88.00
430	18.25	24.25	....	....	....	....
Nickel	31.00	41.00	31.50 41.00	....	....	140.00
Inconel	39.00	51.00	....	....	....	83.00
Monel	32.00	42.00	26.50 33.50	....	....	....
Copper*	....	....	20.70† 25.65‡	....	....	....

* Deoxidized. † 17.20c for hot-rolled. ‡ 22.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville L7; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	27
⅝-in. & ¾-in.	29
⅞-in. and larger	26
Longer than 6 in.:	
All diams.	22
Lag bolts, all diams.:	
6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up bolts	37

NUTS

H.P. & C.P. Reg. & Heavy Square:	Reg.	Heavy
½-in. and smaller	25	
⅝-in. & ¾-in.	23	
⅞-in.-1½-in.	23	
1⅝ in. and larger	16	
H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ¾-in..	28	25
⅞-in.-1½-in. ..	25	23
1⅝ in. & larger	17	16
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ¾-in..	30	27
⅞-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

½-in. and smaller	Hvy.	Reg.	Lght.
	35	41	41
⅝-in. & ¾-in.	30	36	36
⅞-in.-1½ in..	27	31	33
1⅝-in.&larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish ..... 63.5 & 10

Plated finishes ... 50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	50
¾-in. through 1 in.	43
Longer than 6 in.:	
¼-in. through ⅝-in.	33
¾-in. through 1 in.	13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	46
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams.	18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.25c

⅞-in., under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5¼	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	39.00	32.00	30.00
302	39.00	34.50	30.00
303	41.00	38.00	32.50
304	41.00	36.50	31.50
309	53.50	52.50	43.00
316	54.50	56.50	47.50
321	47.00	46.00	35.50
347	51.50	50.00	40.00
410	34.50	28.50	24.50
416	35.00	35.00	25.00
420	42.00	45.00	30.00
430	37.00	29.00	25.00
501	25.50	24.00	13.00
502	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.

Baltimore, bars wire and structurals A10.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip except Type 309 sheets 54.00c, 316 sheets 55.50c; 309 strip 53.00c, 316 strip 57.50c; 309 bars and wire 43.50c, 316 bars and wire 48.50c U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Types 303, 416, 501, 502 S18.

Cleveland, strip A7.

Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.

Dunkirk, N.Y., bars, wire A4.

Duquesne, Pa., bars C3.

Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Harrison, N. J., Types 302, 304, 316 wire and strip D6.

Massillon, all products R2.

McKeesport, Pa., bars; sheets except Type 416 C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & Strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip C4.

So. Chicago, Ill., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars except Type 309 43.50c, type 316 48.50c U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip C8 .

COAL, CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 25.00

Toluol, one deg...18.25-25.75

Industrial xylol ..19.75-27.50

Per ton bulk, ovens

Sulphate of ammonia .$32-45

Cents per pound, ovens

Phenol, 40 (carlots, returnable drums) 13.50

Do., less than carlots..14.25

Do., tank cars 12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-40.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge Iron:	Cents
98+% Fe, carlots	15.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe (minus 325 mesh)	48.50
Powder Flakes	44.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	70.00-135.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots	28.50-31.25
Copper:	
Electrolytic	31.75
Reduced	31.50
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	75.50
Nickel-Silver, 10-ton lots	41.75
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	91.12
Zinc, 10-ton lots	20.50-28.00
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed. over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb	3.00
98.8%, minus 65 mesh, freight allowed, 1000 lb and over	2.90
less than 1000 lb	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-88%, freight allowed, 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvil.fur.	$14.00-14.50
Connellsvil.fdry.	15.00-16.00
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.	‡ 23.40
Chicago, ovens	21.00
Chicago del.	†22.45
Detroit, del.	24.91
Terre Haute, ovens	21.20
Milwaukee, ovens	21.75
Indianapolis, ovens	20.75
Chicago, del.	24.12
Cincinnati, del.	23.67
Detroit, del.	24.65
Ironton, O., ovens	20.40
Cincinnati, del.	22.71
Painesville, O., ovens	21.90
Buffalo, del.	24.02
Cleveland, del.	23.62
Erie, del.	22.04
Birmingham, ovens	19.15
Birmingham, del.	20.20
Philadelphia, ovens	21.25
Neville Island, Pa., ovens	21.00
Swedeland, Pa., ovens	21.20
Portsmouth, O., ovens	20.15
Cincinnati, del.	22.71
Detroit, ovens	21.65
Detroit, del.	22.65
Buffalo, del.	24.69
Flint, del.	24.09
Pontiac, del.	23.04
Saginaw, del.	24.40

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York(city)	5.75	6.84	7.73	6.04	...	5.95	6.64	8.60	5.85	6.10	7.54
New York(c'try)	5.55	6.64	7.53	5.84	...	5.75	6.44	8.40	5.65	5.90	7.34
Boston (city) ..	5.95	6.75	7.37	5.90	...	5.80	6.39	8.70	5.95	6.28	7.48
Boston (c'try) .	5.75	6.55	7.17	5.70	...	5.60	6.19	8.50	5.75	6.08	7.28
Phila. (city) ..	6.60-6.70	6.75	7.10	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try)..	6.35-6.45	6.50	6.85	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city) ...	5.35	6.59	6.66	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.46	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.35	...	6.90	5.63	...	5.53	6.30	...	5.63	5.45	7.13
Wash. (w'hse).	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††[8]	5.55	5.85	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††[8]	5.35	5.65	6.95
Pitts. (w'hse)..	5.15	5.95*	6.60-6.70	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse).	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††[8]	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.30	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse).	5.15	5.95	7.10	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city)..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.05	5.30	...	5.30	5.85	9.75††[8]	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.85	5.10	...	5.10	5.65	9.55††[8]	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	6.94	5.44	...	5.44	6.09	9.89††[8]	5.59	5.74	6.94
Milwau. (c'try)	5.29	6.09	7.14	5.24	...	5.24	5.89	9.69††[8]	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††[8]	5.78	5.93	7.13
St. L. (w'hse).	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††[8]	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[2]	5.25	...	5.25	6.88	...	5.40	5.55	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[2]	5.10	...	5.10	...	...	5.25	5.40	...
Los Ang. (city)	6.10	7.65	7.80	6.15	8.55	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)..	5.90	7.45	7.60	5.95	8.35	5.90	7.55	...	5.90	6.00	8.20
San Francisco .	6.50[9]	7.60[3]	7.50[3]	7.45[9]	8.25[3]	6.30[9]	7.55	...	6.30[9]	6.40[9]	8.50[9]
Seattle-Tacoma.	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [5]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $106. Hard-fired, $142 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ¾" grains; bulk, $33; single paper bags, $38.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Bonne Terre, Mo., Blue Bell, Williams, Plymouth Meeting, Pa., Millvale, W. Va., Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Mo., $12.45; Martin, Millersville, Narlo and Bettsville, O., Billmeyer, Pa., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Wolframite, scheelites, net ton unit, duty paid	$24.00-$24.50

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c, less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 122)

Allocation of Metals Looms

Urgent war needs, coupled with pressure from industrial consumers, ultimately will force government to reinstitute controls over distribution

New York—President Truman will be granted authority to establish allocation controls over copper, lead, zinc, tin, aluminum and other strategic metals. This is the consensus among traders here. How soon this comes about will depend largely upon how quickly pressure builds up for supplies as a result of needs to fill war contracts in addition to buying for normal industrial uses.

To discuss the minerals situation and to advise the President and the Interior Department of the urgent need for adequate supplies of critical metals and minerals, the National Minerals Advisory Council held a conference in Washington last Thursday.

Tin Moves to 97.75c—While domestic buying is decidedly quiet, tin prices continue to advance on basis of a strong market in London and reports of heavy speculative buying in the East. The spot market was 93.00c on July 21, moved up to 96.00c on July 24, to 97.50c on July 26 and to 97.75c the following day, at which time the market was holding at 96.50c for August, 96.00c for September and 97.00c for October.

Since the Korean War, the tin market was advanced over £133 in Singapore, £141 in London and nearly 22 cents here. In view of these sharp price advances, it would not be surprising if the government should impose controls over this market in its initial move to regulate industry.

Copper Stocks Dip—Although demand for copper continues well in excess of supply, prices remain unchanged at 22.50c, delivered Valley. Sales to fabricators in July will be in excess of 100,000 tons. Copper contained in products shipped by fabricators to customers in the first half totaled 708,416 tons, against 490,827 tons in the like 1949 period. Stocks in fabricators' hands at the end of June were 332,330 tons compared with 338,504 tons a month previously.

Lead Demand Gains—Following a lull of several days, lead demand again has become active with heavy trading for August and September shipment. Supplies, however, are adequate to cover nearby needs. The favorable supply position is bolstered by substantial imports.

Shipments of refined lead to domestic consumers declined sharply to 35,774 tons in June from 45,702 tons in May, but were well above the 29,132 tons shipped in June, 1949. Total shipments in the first six months of 1950 totaled 185,123 tons compared with 179,232 tons in the like 1949 period.

Stocks of lead at refineries at the end of June totaled 69,025 tons, showing a decline of about 7200 tons from the total on hand at the end of May. At the end of June, 1949, stocks totaled 96,367 tons.

Production declined in June to 44,490 tons from 48,989 tons in May and compared with 45,455 tons a year previously. Total output for the first six months of 1950 amounted to 279,961 tons, or about 8000 tons less than in the corresponding period a year ago.

Zinc Export Price Up—Zinc prices in the export market are higher, with as much as 16.25c, f.a.s. Gulf ports reported on tonnage for shipment to India. The domestic market is steady, however, on the basis of 15.00c, St. Louis, for prime western. Some sellers are virtually out of the market, having sold most of their August tonnage and not as yet having opened books for September. Some others, however, are now accepting some tonnage for the latter position.

Reynolds Rescinds Advances

Louisville — Reynolds Metals Co. rescinded its increases in aluminum prices which had been effected July 19. The action was taken to give "wholehearted support" to President Truman's program to help prevent prices from getting out of hand. The company originally had posted increases to counteract rising costs in production.

Remelt Aluminum Prices Jump

New York — Secondary aluminum ingot prices have been advanced ½ cent to 1.25 cents a pound by several of the largest smelters, due to the sharp rise in cost of scrap. The upward adjustments, effected in two moves, were not uniform for the entire industry. Many of the smaller factors, fearing the government will impose price regulations if prices are not held in check, are quoting generally the lower levels of published ranges. Piston alloys are quoted 19.00c to 19.75c while grade 2 of No. 12 foundry alloy is quoted 18.25c to 19.00c.

Remelt ingot producers claim that one of the primary aluminum producers is offering extremely high prices for scrap, resulting in a sharp drop in supplies available to the secondary industry. Trade reports indicate that 14.00c to 14.25c have been paid for 3S, 51S, 52S and 61S clippings; 13.50c for 14S, 17S 24S and the mixed clippings; 12.50c for old sheet; 12.25c for cast aluminum; 12.00c for borings and turnings. These prices represent increases of about ½ cent to ¾ cent over previously quoted levels. It is also reported that a large primary producer is offering 15.00c a pound now for all items down to and including the mixed clippings.

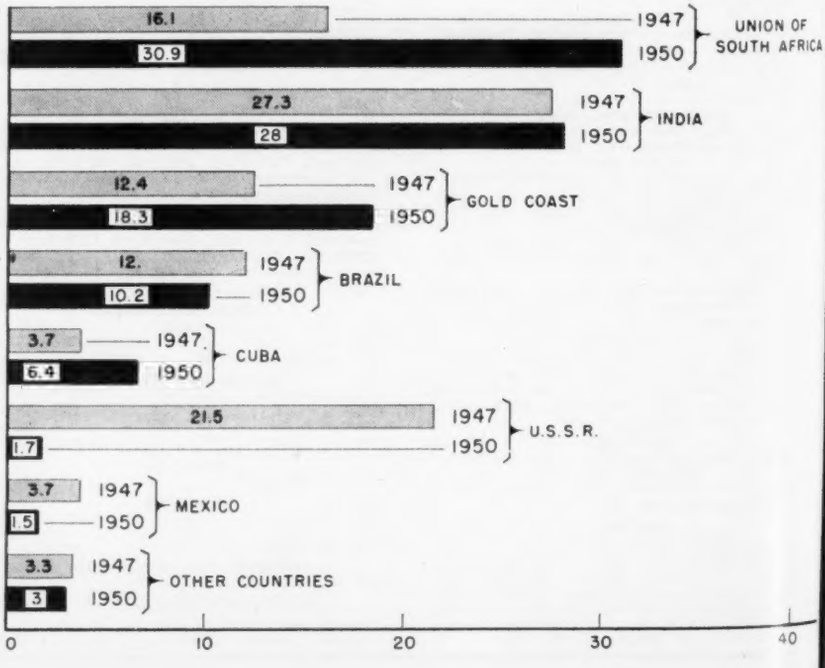
Mercury Prices Rise Sharply

New York—Unusually heavy buying of mercury since the outbreak of war in Korea has absorbed practically all metal available for spot delivery in bulk quantity. Following large sales at $73 a flask for large lots, domestic producers withdrew from the market. An importer, who has substantial quantities available for nearby shipment, is quoting a range of $77 to $78 a flask for large lots. Foreign mercury in lots of 100 flasks and more for August-September arrival from Europe is quoted $75 a flask, duty paid ex dock New York. Only a limited amount of mercury in small lots is available at $79 to $80 a flask.

Turn to India and Africa for More Manganese

. . . Korean crisis emphasizes drop in imports from Russia

(Percentage of 1947 imports compared with first quarter, 1950)



NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 22.50c, Conn. Valley; Lake 22.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 22.50c; No. 1 yellow (No. 405) 19.00c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.10c, delivered.

Lead: Common 11.80c; chemical 11.90c; corroding 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.50c, pigs 16.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 19.00-19.75c; No. 12 foundry alloy (No. 2 grade) 18.25-19.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 19.50-20.00c; grade 2, 18.50-19.50c; grade 3, 17.75-18.25c; grade 4, 17.50-18.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 22.50c, f.o.b. Freeport, Tex.

Tin: Grade A, spot 97.75c, Aug. 96.50c Sept. 96.00c, Oct. 97.00c del.

Antimony: American 99-99.8% and over but not meeting specifications below 24.50c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 25.00c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 20.75c; English, 21.00c; Belgian, 21.50c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $77-$80 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2.15 del.; special or patented shapes, $2.30.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $74-$77 per ounce.

Palladium: $24 per troy ounce.

Iridium: $160 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 22.50-cent copper.)

Sheet: Copper 37.43; yellow brass 34.19; commercial bronze, 95%, 37.38; 90%, 36.93; red brass, 85% 35.96; 80%, 35.52; best quality, 35.04; nickel silver, 18%, 48.39; phosphor-bronze, grade A, 5% 55.11.

Rods: Copper, hot-rolled 33.28; cold-drawn 34.53; yellow brass free cutting, 28.54; commercial bronze, 95% 37.07; 90% 36.62; red brass 85% 35.65; 80% 35.21.

Seamless Tubing: Copper 37.47; yellow brass 37.20; commercial bronze 90% 39.59; red brass 85% 38.87; 80% 38.43.

Wire: Yellow brass 34.48; commercial bronze, 95% 37.67; 90% 37.22; red brass, 85% 36.25; 80% 35.81; best quality brass 35.33.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 26.67, l.c.l. 27.17, 100,000 lb lots 26.545; weatherproof, f.o.b. eastern mills, c.l. 28.10, l.c.l. 28.60, 100,000 lb lots 27.85; magnet, del., 15,000 lb or more 32.50, l.c.l. 33.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	27.4	...	...
0.135-0.096	12-48	27.9	...	...
0.095-0.077	12-48	28.4	26.5	30.1
0.076-0.061	12-48	29.0	26.7	30.3
0.060-0.048	12-48	29.2	26.9	30.6
0.047-0.038	12-48	29.6	27.1	30.9
0.037-0.030	12-48	30.0	27.5	31.4
0.029-0.024	12-48	30.4	27.8	31.8
0.023-0.019	12-36	31.0	28.2	32.3
0.018-0.017	12-36	31.6	28.8	33.1
0.016-0.015	12-36	32.3	29.4	34.0
0.014	12-24	33.2	30.2	35.1
0.013-0.012	12-24	34.1	30.9	36.0
0.011	12-24	35.1	31.8	37.2
0.010-0.0095	12-24	36.1	32.8	38.5
0.009-0.0085	12-24	37.3	33.9	40.0
0.008-0.0075	12-24	38.6	35.1	41.6
0.007	12-18	40.0	36.4	43.4
0.006	12-18	41.5	37.7	47.5

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	——Hexagonal—— 17S-T4
0.125	48.5	....	....
0.156-0.203	41.5	....	....
0.219-0.313	38.5	....	....
0.344	37.5	....	47.5
0.375	37.0	46.0	44.5
0.406	37.0	....	....
0.438	37.0	46.0	44.5
0.469	37.0	....	....
0.500	37.0	46.0	44.5
0.531	37.0	....	....
0.563	37.0	....	42.0
0.594	37.0	....	....
0.625	37.0	43.5	42.0
0.656	37.0	....	....
0.688	37.0	....	42.0
0.750-1.000	36.0	41.0	39.5
1.063	36.0	....	38.0
1.125-1.500	35.0	39.5	38.0
1.563	35.0	....	37.0
1.625	34.0	....	37.0
1.688-2.000	34.0	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends: List prices plus 45%.

ZINC

Sheets, 20.75c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.00c; over 12-in., 20.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 75.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip, cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-59.00c; 25 to 99 lb. 45.00-49.00c; 100 lb to 5000 lb, 38.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 34.09c; oval 33.59c; cast 32.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 51.40c, under 1000 lb 49.40c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 28.00c; over 200 lb, 27.00c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c; 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 29.50c; 400-lb bbl, 27.50c up to 10,000 lb, 27.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 44.6c, 10 or more drums 42.6c, f.o.b. Niagara Falls, N. Y.; 45.85c and 43.85c, respectively, del. Cleveland or Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Heavy Clean	Ends Rod	Turnings Clean
Copper	19.50	19.50	18.75
Yellow Brass	16.75	16.50	15.50
Commercial Bronze			
95%	18.50	18.25	17.75
90%	18.375	18.125	17.625
Red brass			
85%	18.125	17.875	17.375
80%	17.875	17.625	17.125
Best Quality (71-80%)	17.50	17.25	....
Muntz metal	15.75	15.50	15.00
Nickel, silver, 10%	19.12½	18.87½	9.56¼
Phos. bronze, A	19.75	19.50	18.50
Naval brass	16.12½	15.87½	15.37½
Manganese bronze	16.12½	15.87½	15.25

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 19.50; No. 2 copper 18.50; light copper 17.50; composition red brass 16.00; radiators 13.00; heavy yellow brass 12.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.50; No. 2 copper 18.50; light copper 17.50; refinery brass (60% copper) per dry copper content 17.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 17.75-18.00; No. 2 16.50-16.75; light copper 15.50-15.75; No. 1 composition red brass 14.25-14.50; No. 1 composition turnings 13.75-14.00; mixed brass turnings 8.75-9.00; new brass clippings 15.00-15.25; No. 1 brass rod turnings 13.25-13.50; light brass 8.75-9.00; heavy yellow brass 10.00-10.25; new brass rod ends 13.50-13.75; auto radiators, unsweated 11.00-11.25; cocks and faucets, 12.75-13.00; brass pipe 13.00-13.25.

Lead: Heavy 9.50-9.75; battery plates 5.25-5.50; linotype and stereotype 11.50-11.75; electrotype 9.75-10.00; mixed babbitt 9.75-10.00.

Zinc: Old zinc 8.00-8.25; new die cast scrap 8.25-8.50; old die cast scrap 5.50-5.75.

Tin: No. 1 pewter 39.00-41.00; block tin pipe 60.00-62.00; No. 1 babbitt 30.00-32.00.

Aluminum: Clippings 2S 11.50-12.00; old sheets 8.50-9.00; crankcase 8.50-9.00; borings and turnings 5.50.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July 27	22.50	11.80	15.00	97.75	17.50	24.50	48.00	72.75
July 26	22.50	11.80	15.00	97.50	17.50	24.50	48.00	72.75
July 24-25	22.50	11.80	15.00	96.00	17.50	24.50	48.00	72.75
July 21-22	22.50	11.80	15.00	93.00	17.50	24.50	48.00	72.75
July 20	22.50	11.80	15.00	91.00	17.50	24.50	48.00	72.75
July 19	22.50	11.80	15.00	89.50	17.50	24.50	48.00	72.75
July 18	22.50	11.80	15.00	91.00	17.50	24.50	48.00	72.75
July 17	22.50	11.80	15.00	91.75	17.50	24.50	48.00	72.75
July 14-15	22.50	11.80	15.00	96.50	17.50	24.50	48.00	72.75
July 13	22.50	11.80	15.00	92.00	17.50	24.50	48.00	72.75
July 12	22.50	11.30	15.00	87.25	17.50	24.50	48.00	72.75
July 11	22.50	10.80	15.00	84.75	17.50	24.50	48.00	72.75
July 10	22.50	10.80	15.00	82.75	17.50	24.50	48.00	72.75
July 7-8	22.50	10.80	15.00	81.375	17.50	24.50	48.00	72.75
July 6	22.50	10.80	15.00	80.50	17.50	24.50	48.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, July 27, 1950; gross tons. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

July 27	$37.33
July 20	37.25
June 1950	39.25
July 1949	19.21
July 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$41.00
No. 2 Heavy Melt.	35.00
No. 1 Busheling	41.00
No. 1 Bundles	41.00
No. 2 Bundles	*34.00*
Heavy Turnings	37.00-38.00
Machine Shop Turnings	30.00-31.00†
Mixed Borings, Turnings	30.00-31.00†
Short Shovel Turnings	33.50-34.50
Cast Iron Borings	32.00-33.00
Low Phos. Steel	45.00

Cast Iron Grades

No. 1 Cupola Cast	*38.00-39.00*
No. 1 Machinery Cast	43.00-43.50
Charging Box Cast	*40.00*
Heavy Breakable Cast	36.50-37.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
Rails, Random Lengths	43.00
Rails, 2 ft. and under	48.00
Rails, 18 in. and under	49.00
Railroad Specialties	*46.00-47.00*
Axles	44.00
Angles, Splice Bars	45.00

† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$38.00-39.00
No. 2 Heavy Melt. Steel	33.00-34.00
No. 1 Busheling	38.00-39.00
No. 1 Bundles	38.00-39.00
No. 2 Bundles	29.00-30.00
Machine Shop Turnings	24.00-25.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	27.00-28.00
Low Phos.	40.00-40.50

Cast Iron Grades

No. 1 Cupola	45.00-46.00
Charging Box Cast	41.00-42.00
Stove Plate	40.00-41.00
Heavy Breakable Cast	38.00-39.00
Unstripped Motor Blocks	31.00-32.00
Brake Shoes	33.00-34.00
Clean Auto Cast	45.00-46.00
No. 1 Wheels	41.00-42.00
Burnt Cast	35.00-36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00
R.R. Malleable	49.00-50.00
Rails, 3 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, Random Lengths	48.00-49.00
Cast Steel	41.50-42.00
Railroad Specialties	45.00-46.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-50.50

VALLEY

No. 1 Heavy Melt. Steel	$40.50-41.00
No. 2 Heavy Melt. Steel	35.50-36.00
No. 1 Bundles	40.50-41.00
No. 2 Bundles	31.50-32.00
Machine Shop Turnings	28.00-28.50
Short Shovel Turnings	30.50-31.00
Cast Iron Borings	30.50-31.00
Low Phos.	43.50-44.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$33.00
No. 2 Heavy Melt. Steel	31.00
No. 1 Busheling	32.00
No. 1 Bundles	33.00
No. 2 Bundles	27.00-27.50
Machine Shop Turnings	*24.00*
Short Shovel Turnings	29.00
Mixed Borings, Turnings	22.00-23.00
Low Phos. Punchings and Plate, elec. fur. grade	*39.00-40.00*
Low Phos. Plate, 5 ft & Under	*39.00-40.00*
Elec. Furnace Bundles	34.00*
Heavy Turnings	33.00*
No. 1 Chemical Borings	34.00
Knuckles and couplers	41.00-43.00
Steel car wheels	41.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	36.00
No. 1 Machinery Cast	39.00-40.00
No. 1 Yard Cast	34.00
Charging Box Cast	36.00-37.00
Heavy Breakable Cast	*36.00-37.00*
Clean Auto Cast	39.00-40.00
No. 1 Wheels	41.00-42.00
Malleable	*45.00*

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	31.00
No. 1 Busheling	37.00
No. 1 Bundles	37.00
No. 2 Black Bundles	30.00
No. 3 Bundles	26.00
Machine Shop Turnings	21.00
Short Shovel Turnings	24.00
Mixed Borings, Turnings	23.00
Cast Iron Borings	24.00

Cast Iron Grades

No. 1 Cupola Cast	47.00
Charging Box Cast	36.00
Stove Plate	33.00
Heavy Breakable Cast	38.00
Unstripped Motor Blocks	29.00
Brake Shoes	26.00
Clean Auto Cast	47.00
Drop Broken Cast	49.00
Low Phos., 18 in. and under	47.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00
R.R. Malleable	44.00
Rails, Rerolling	44.00
Rails, Random Lengths	42.00
Rails, 18 in. and under	50.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$28.50-29.50*
No. 1 Bundles	*38.50-39.50*
No. 2 Bundles	*26.00-27.00*
No. 1 Busheling	*36.00-37.00*
Machine Shop Turnings	*23.00-24.00*
Forge Flashings	*36.00-37.00*
Short Shovel Turnings	*25.00-26.00*
Cast Iron Borings	*25.00-26.00*
Punchings & Plate Scrap	*38.50-39.50*

Cast Iron Grades

No. 1 Cupola Cast	*40.00-41.00*
Heavy Breakable Cast	*33.00-34.00*
Clean Auto Cast	*44.00-45.00*

BUFFALO

No. 1 Heavy Melt. Steel	$36.50-37.00
No. 2 Heavy Melt. Steel	33.00-33.50
No. 1 Busheling	33.00-33.50
No. 1 Bundles	34.00-34.50
No. 2 Bundles	31.00-31.50
Machine Shop Turnings	27.00-28.00
Mixed Borings, Turnings	27.00-28.00
Cast Iron Borings	27.00-28.00
Short Shovelings	29.00-30.00
Low Phos.	38.50-39.00

Cast Iron Grades

No. 1 Cupola	35.50-36.00
No. 1 Machinery	38.50-39.00
Malleable	32.50-33.00

Railroad Scrap

Rails, 2 ft. and under	46.50-47.00
Rails, random size	40.50-41.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$30.00*
No. 2 Heavy Melt. Steel	26.00-27.00
No. 1 Busheling	27.00-28.00
No. 1 Bundles	*30.00*
No. 2 Bundles	25.00-25.50
Machine Shop Turnings	17.00-18.00
Mixed Borings, Turnings	17.00-18.00
Short Shovel Turnings	*21.00-22.00*
Punchings & Plate Scrap	*31.00-32.00*
Low Phos. Plate, 5 ft & under	*31.00-32.00*
Elec. Furnace Bundles	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	29.00-29.50
No. 1 Machinery	30.00-31.00
Charging Box Cast	29.00-29.50
Heavy Breakable	29.00-29.50
Unstripped Motor Blocks	21.00-22.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$28.50-29.00*
No. 2 Heavy Melt. Steel	*23.00-23.50*
No. 1 Bundles	*28.50-29.00*
No. 1 Busheling	*28.50-29.00*
Machine Shop Turnings	*19.50-20.50*
Mixed Borings, Turnings	*18.00-18.50*
Short Shovel Turnings	*22.00-23.00*
Bar Crops and Plate	*32.00-34.00*
Punchings & Plate Scrap	*32.00-34.00*
Chemical Borings	21.00-21.50

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	28.00-29.00
Heavy Breakable Cast	31.00-32.00
Stove Plate	26.50-27.00

CHICAGO

No. 1 Heavy Melt. Steel	*$38.00*
No. 2 Heavy Melt. Steel	*36.00*
No. 1 Bundles	*38.00*
No. 2 Bundles	*31.00*
Machine Shop Turnings	24.50-25.50
Mixed Borings ,Turnings	25.00-26.00
Short Shovel Turnings	26.00-27.00
Cast Iron Borings	*26.00-27.00*
Low Phos.	39.00-40.00
Elec. Furnace Bundles	38.00-39.00
Heavy Turnings	29.00-30.00
Cut Structurals	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	44.00-45.00
Clean Auto Cast	44.00-45.00
No. 1 Wheels	38.00-39.00
Stove Plate	36.00-37.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-40.00
Malleable	44.00-45.00
Rails, Rerolling	48.00-49.00
Rails, Random Lengths	43.00-44.00
Rails, 2 ft and under	46.00-47.00
Rails, 18, in. and under	47.00-48.00
Railroad Specialties	42.00-43.00
Angles, Splice Bars	44.50-45.50

BIRMINGHAM

No. 1 Heavy Melt. Steel	*$31.00-31.50*
No. 2 Heavy Melt. Steel	*28.00*
No. 1 Busheling	29.00-30.00
No. 2 Bundles	*22.00*
Machine Shop Turnings	25.00-26.00
Mixed Borings, Turnings	*28.00*
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	24.00-25.00
Bar Crops and Plate	*37.00-38.00*
Cut Structurals	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	*40.00-41.00*
Stove Plate	*34.00-35.00*
No. 1 Wheels	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	35.00
R.R. Malleable	nominal
Rails, Rerolling	*43.00-44.00*
Rails, 3 ft and under	*nominal*
Angles and Splice Bars	40.00-41.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$36.00-38.00
No. 2 Heavy Melt. Steel	32.00-33.00
No. 1 Bundles	36.00-38.00
No. 2 Bundles	32.00-33.00
No. 3 Bundles	27.00-29.00
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	39.00-41.00
Charging Box Cast	35.00-37.00
Heavy Breakable Cast	35.00-36.00
Brake Shoes	37.00-38.00
Clean Auto Cast	40.00-42.00
Burnt Cast	35.00-36.00

Railroad Scrap

R.R. Malleable	41.00-42.00
Rails, Rerolling	48.00-50.00
Rails, Random Lengths	39.00-41.00
Rails, 3 ft and under	45.00-46.00
Uncut Tires	38.00-39.00
Angles, Splice Bars	43.00-44.00
Railroad Specialties	41.00-42.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Bundles	18.00
No. 2 Bundles	17.00
No. 3 Bundles	15.00
Machine Shop Turnings	9.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Rails, Random Lengths	22.00

SEATTLE

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	17.50
Nos. 1 & 2 Bundles	18.00
No. 3 Bundles	16.00
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	27.50-30.00
Cut Structurals	27.50-30.00

Cast Iron Grades

No. 1 Cupalo Cast	30.00
Heavy Breakable Cast	27.50
Stove Plate	25.00
Unstripped Motor Blocks	25.00
Malleable	27.50
Brake Shoes	25.00
Clean Auto Cast	30.00
No. 1 Wheels	30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00
Railroad Malleable	27.50
Rails, Random Lengths	21.00
Angles and Splice Bars	21.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	20.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	13.00
Machine Shop Turnings	7.50
Mixed Borings, Turnings	5.00
Punchings & Plate Scrap	30.50

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Rails, Rerolling	33.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
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Cast	40.00-43.00*

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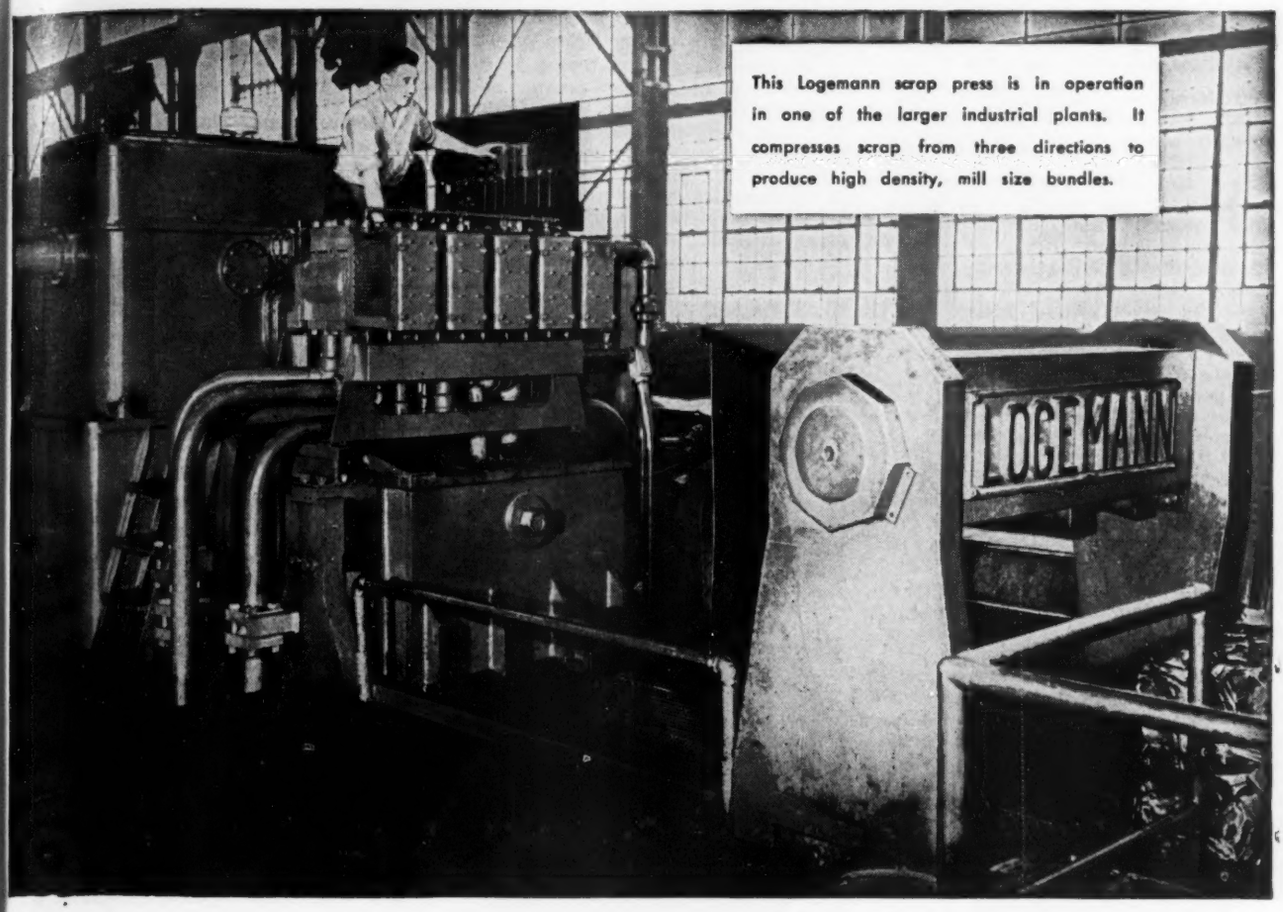

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Sheets Strip . . .

Sheet and Strip Prices, Page 101 & 102

Pittsburgh — Current distribution pattern for sheets and strip is expected to remain intact through August. But as early as September chances are increasing tonnage will be diverted for military purposes under voluntary allocation or government imposed priorities.

Allotments to civilian goods groups probably also will be adversely affected by diversion of some sheet rolling capacity to production of plates for sharply augmented freight car construction or other military related programs.

Efforts of customers to augment inventories prior to establishment of distribution controls must be restricted to intensified efforts to line up conversion steel tonnage. Mills still are liquidating the large carryover tonnage accumulated in the first half.

Boston—Substantial sector of the sheet producing industry has practically halted acceptance of new orders pending adoption of government policy with respect to distribution. Relatively little mill tonnage is committed beyond October. Meanwhile, consumers seek to place heavy orders, offering the same lots to several mills. Both sheet and strip quotas are likely to be revised as military needs develop.

New York — Sheet sellers have taken little action for fourth quarter. Some have made allocation for October on a limited scale insofar as new tonnage is concerned. Some have taken no action at all. Broad disposition is to await defense developments.

October allotments by most mills are comprised completely of tonnage promised for current quarter. Some mills figure they will have arrearages of at least six weeks by end of this quarter.

Philadelphia — Major grades of sheets are among the few items on which books have not been fully opened for fourth quarter by several producers. Some have set up allocations for October but that appears to be as far as anyone has gone to date. On some specialties, such as electrical sheets, sellers are booked solidly through remainder of the year.

Cleveland—Consumers' frantic efforts to place additional tonnage on mill books in anticipation of military priorities later in the year are proving fruitless. Producers are booked to capacity into fourth quarter and they are accepting only regular tonnage from their customers based upon past sales records and established quotas. Indications are fourth quarter quotas will be cut as military needs develop. All the mills express willingness to accept their share of any armament demands that may develop, indicating such business will be given the green light at the expense of civilian tonnage on a voluntary basis.

Cincinnati—Pressure for sheets is intensified. Little steel is being diverted to war material though specifications are heavier from fabricators normally doing government work. There are indications mills voluntarily are giving these priority.

Chicago—Consumers trying to ride government orders for greater steel tonnages are meeting with failure. Mill men feel fabricators should take necessary tonnage for military work out of their existing quotas. Some fabricators accepted military orders because they felt they could bring more pressure to bear on mills with them. Mills are moving slowly working out fourth quarter sheet quotas. Steelmaking costs are under upward pressure but mills are trying to avoid raising quotations.

Birmingham—Books have not been opened for fourth quarter but consumers are pressing for tonnage.

San Francisco—Fabricators report increased inquiry for their products as a result of the war-scare. This is tightening the squeeze brought about by the shortage of steel. Supplies of light, flat-rolled steel are being steadily reduced. Shipments from eastern mills are down.

Plates . . .

Plate Prices, Page 101

Philadelphia — While most plate mills have set up allocations for October, they generally are not obligating themselves beyond for the reason they do not know what national emergency demands will be. Clauses in most contracts give priority to such needs and have been so worked in one form or another ever since the last war. Hence, allotments for October, or nearer, could be altered if necessary.

Effective Aug. 4, a supplement will be applied to the tariff in classification territory covering reductions in rates on certain products moved in minimum quantities of 80,000 pounds. The supplement is designed to clear up confusion resulting from terminology as applied to plates. The term as now used has never applied to structural plates, as many in the trade had interpreted it. The new term, it is said will be tin plate. Meanwhile, adding of structural plate to the list continues under consideration.

A district shipyard is figuring actively on two sea-train type ships, requiring 9000 tons of hull steel, principally plates.

New York—Plate demand is accelerating in practically all directions, including some ship work. Tank fabricators are experiencing a spurt in orders. Eastern plate mills are moving slowly in setting up schedules for fourth quarter. Some have switched to a monthly basis and to date have not extended allocations beyond October.

Boston—Plate mills are jammed with orders for fourth quarter delivery. With railroad car tonnage still unassigned in full, coupled with heavier demand for armament, both direct and indirect, indicating quota cutbacks, the situation in plates has reached the point where some sheet mills may soon be converted to rolling light plates.

Chicago—Light-gage plate is in even heavier demand than cold-rolled sheets, producers report. Tonnage arrearage into fourth quarter will be huge. Allocations to freight car builders are almost certain to be the first requirement in any formal distribution scheme.

Birmingham—Plate users continue to press mills for tonnage but supply is not sufficient to go around. Strike has delayed production at Pullman Standard Car Co. but efforts to build inventories continue.

Los Angeles—Fabricators are increasingly receptive of gray market offerings. Twenty tons of 12-gage hot-rolled plate scheduled for May 20 delivery to a fabricator, was postponed to June 17, postponed again to July 8—has been re-scheduled for September mill shipment.

Steel Bars . . .

Bar Prices, Page 101

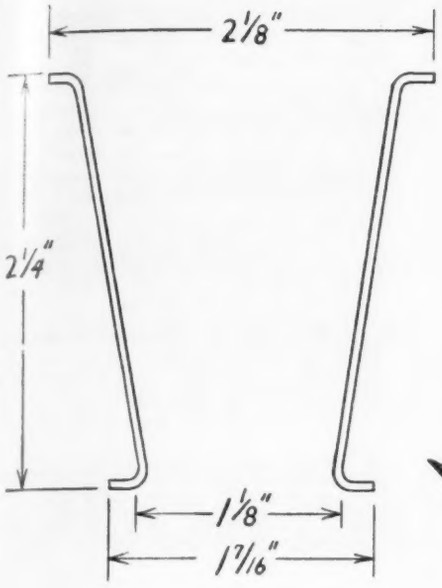
Cleveland—Bar mills are booked into October on hot bars and they could go beyond were they inclined to accept all the tonnage offered them. Consumer pressure has intensified since the outbreak of the Korean war but the mills are sticking to past sales records in determining allotments. Buyers' hopes of accumulating inventories before allocations for military needs are applied appear forlorn. Little new armament business has appeared but when it does it will be given the greenlight in mill schedules. Cold-finished bar supplies are tighter with cold-finishers unable to obtain all the hot bars they require. Demand for alloy bars is definitely stronger. To some extent this reflects pickup in armament requirements. Prices generally are unchanged though Copperweld Steel Co. last week increased nickel steels about $2 per ton to compensate for the recent 8 cents per lb hike in the price of nickel.

Boston — Some producers of bars are limiting new volume to armament requirements which are appearing in the form of shell and rocket contracts. In some cases producers have ceased taking orders until government distribution policy is clarified. Old orders are being processed, deliveries extending into October.

New York—Hot carbon bar demand is stronger. Those producers who opened books for fourth quarter are virtually booked up on all sizes and could easily be booked up solidly if they were disposed to take all the business offered them. Many orders probably will be cut back as war requirements become more pressing. The situation in cold drawn carbon bars is mixed. Where cold drawers have to rely on mills for hot bar stock, they can promise little tonnage before late October or early November, but where they have rough stock in storage they can give four to five weeks delivery. Hot and cold alloy bar shipments are becoming slightly more extended, averaging around six to seven weeks.

Philadelphia—Demand for alloy bars has spurted, ascribed in part to the need for this material as a substitute for plain carbon bars which have become extremely scarce.

Pittsburgh—Until scope of military requirements is known it will be impossible to determine extent mill



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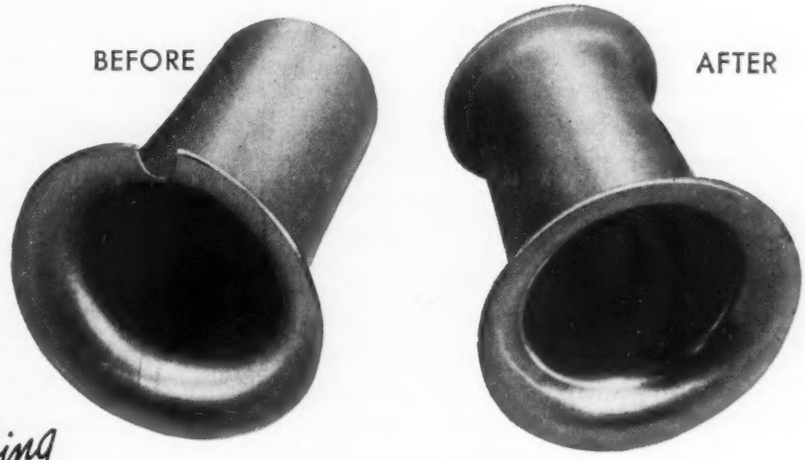

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allotments of carbon and alloy steel bars will be curtailed among civilian goods groups. Intensified customer pressure to augment stocks are fruitless since distribution already is under strict quotas because of unbalanced demand-supply. No openings in production schedules are available before October on both open hearth and electric furnace alloy grades.

Chicago—Allocation of alloy bars is contemplated by some producers. Demand has accelerated since the war's outbreak and an increasing amount of alloy steel is being used in substitution for the rigidly rationed carbon grade. One producer of alloy is quoting November delivery. Cold-drawers are operating far below capacity because of tight hot bar supply.

Los Angeles—Bar producers report strong demand. One cold-finisher says volume has tripled. Some cold-finishers are not booking beyond immediate supplies of hot bars.

Vancouver, B. C.—Vancouver Rolling Mills Ltd., this city, reports heavy demand for merchant and reinforcing bars and small shapes.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 101

Los Angeles—Requirements for reinforcing bars are rising and supplies are tightening. State highway needs are down but other construction sustains the market. The AFL Carpenters Union strike, now in its third week, has halted $529 million worth of construction.

Stainless Steel . . .

Stainless Steel Prices, Page 104

Pittsburgh—Production of stainless ingots this year is expected to set a record of 800,000 to 850,000 tons. Indicated output of 450,000 tons of finished product is seen topping that of 1948, best previous year, by about 20 per cent.

Producers do not expect upward production trend will continue through remainder of year, due to capacity limitations and reduction in nickel allotments. At least one producer plans to expand electric furnace and finishing facilities early in 1951.

Consumers are attempting to stockpile before military priorities develop. Order backlogs on strip extend into November and on sheets into October. Current deliveries are available on bar stock, with plates promised in 3 to 4 weeeks.

Adverse nickel supply outlook presents a serious production obstacle. Some producers' allotments have been cut about 25 per cent.

Recent substantial advance in nickel prices, has prompted stainless steel producers to pressure customers for return of nickel bearing scrap. Sharp rise in nickel scrap has resulted with quotations now around $150 per gross ton for known 18-8 analysis and $85 for straight chrome. These prices compare with $90 and $45 last spring.

Tool Steel . . .

Tool Steel Prices, Page 103

Pittsburgh—Tool steel producers have increased operations. Improved demand is expected to gain momentum in step with the expanded military procurement program. Shortage of nickel may force some stainless high speed steel users to rely more heavily on molybdenum grades. Sellers are still giving 4 to 6 weeks delivery on specialty steel made to specifications, and prompt delivery on standard items from stock.

Structural Shapes . . .

Structural Shape Prices, Page 101

New York—Korean situation is resulting in the setting aside of some structural work, plans for which have not become too far advanced. However, work well through planning stage, with all authorizations made, is being speeded up. Fabricators' orders are heavier and delivery promises are being extended, due, in part, to tightening shape deliveries.

Allocations for fourth quarter have been cut substantially. Some larger fabricators are unable to accept business for shipment under five and five and one-half months; smaller fabricators are quoting four months and beyond.

June bookings are estimated at 266,531 tons, according to the American Institute of Steel Construction, largest since April, 1942. Total bookings of 1,036,001 tons for the first six months were 48 per cent greater than in corresponding period of 1949.

June shipments amounted to 162,343 tons, 6 per cent less than the corresponding months in 1949. Total shipments for first six months were off from a year ago, but were 36 per cent greater than in the average first half of the 1936-1940 period.

Backlogs for the four months beginning July increased to 579,583 tons.

Philadelphia—Fabricators report a rush of demand as builders endeavor to get work under way before a shortage of steel for this purpose becomes too acute. Leading shape producers are virtually booked up for remainder of the year. Fabricators are selective in acceptances, turning away considerable business. Delivery promises are further extended, running five and six months in some cases.

Meanwhile, speculation exists as to possible effect of the national emergency on many types of building construction as time goes on. State authorities and commissions behind large road building programs are reported willing to drop some work. However, some believe this type of construction would prove important to defense and where well along would probably be approved for completion.

Boston—With some long dormant building projects being revived, inquiry for structurals is broader. Fabricated steel prices are steadier and plain material deliveries are more extended. Pending bridge requirements are slightly smaller but include 1500 tons for 11 steel stringer bridges for Massachusetts.

Chicago—Fabricators are seeking to build inventories in expectation construction steel will be more difficult to obtain. Use for structurals which will play a more significant part in fabricators' business is for Bailey bridges, now being built in some shops in the area. Shape producers doubt any sizable new industrial construction will result from speed-up in preparedness.

San Francisco—Demand is strong for structural shapes. Part of the increasing business comes from an increase in construction, but there also is considerable buying for stockpile.

Vancouver, B. C. — Fabricating plants report active bookings for bridges, pulp mills, public works and general construction.

Wire . . .

Wire Prices, Page 103

Boston—Wire buyers seeking additional tonnage in anticipation of allocations are meeting with only limited success in some products, including heading wire. Most mills are accepting fourth quarter tonnage subject to any controls that may be effected. Aircraft demands are heavier. Upholstery spring wire demand has spurted, but requests include some duplicate tonnage. The same is true of other wire items. Wire rope is more active.

New York — Wire manufacturers are beginning to allocate tonnage because of heavy demand since first of the month. High and low carbon grades of wire are under special pressure. Some wire makers are booked solidly for 10 to 12 weeks ahead.

Chicago — War-scare buying of merchant products is mounting. Demand amounting to a virtual "run" on building-type nails is noted and jobbers and dealers of wire products for farm use are unable to keep inventories abreast of requirements.

Birmingham—Wire users' demands are heavier and some fourth quarter commitments have been made.

Tin Plate . . .

Tin Plate Prices, Page 102

Boston — Demand is seasonally heavy due to the sardine pack in upper New England. Some buyers underestimated requirements and with light inventories the mills are limited on stock shipments. One supplier of cans for the sardine industry is allocating containers.

San Francisco — Indications are this year's food pack in California will run slightly above that of 1949. Demand is expected to increase as the armed forces grow. As a result American Can Co. is making plans to build its eighth California can-making plant, and Continental Can Co. is preparing a $2 million expansion in southern California.

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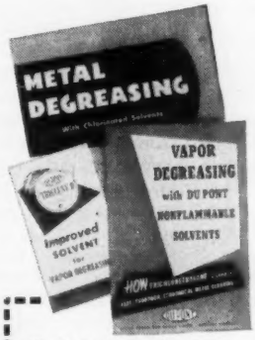

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Tubular Goods . . .

Tubular Goods Prices Page 104

Boston—In addition to taking full allocations merchant pipe distributors are seeking extra tonnage, but with only limited success. Utilities also are anticipating requirements further ahead, one seeking to cover on 10,000 tons for 1951.

Pittsburgh — Jobbers' stocks of standard pipe are unbalanced. Demand for oil country goods and transmission lines will increase to meet augmented military petroleum needs.

Los Angeles—Oil producers are inquiring for large quantities of small diameter pipe and seamless tubing. Supplies of seamless tubing are currently sufficient to meet normal requirements.

Semifinished Steel . . .

Semifinished Prices, Page 101

Pittsburgh—Marked increase in inquiries for conversion tonnage is noted, notably from metalworking companies not likely to share in war contracts. The scramble currently approaches that of 1947 and 1948, and involves commitments over periods of 3 to 6 months instead of on a month to month basis. While prices at the mill or delivered are $25 to $50 per ton below peak levels of 1948, they have spiraled lately.

One company producing carbon steel in electric furnaces is quoting the following, except as noted, on 100 pound basis: slabs, $95 per ton; sheet bars, $5.35; hot-rolled sheets, $5.65; hot-rolled strip, $5.55; universal plates, $5.80; sheared plates, $6.65; and hot-rolled bars, $5.75.

Open market transactions in ingots range between $68 and $73 at mill and $72 to $80 delivered Chicago; slabs are being delivered to Chicago area for conversion at $85 to $95; sheet bars are quoted at $95 to $105 and forging billets and blooms at $100 to $110.

Prices on finished products resulting from conversion deals are said to cost end users $130 to $140 per ton delivered on hot-rolled strip and about $10 to $15 less for sheets; cold-rolled strip prices have climbed to range of $200 to $220 per ton, with the same differential for hot-rolled.

The major bottleneck in obtaining conversion steel today is finding mill rolling time. There appears to be relatively little difficulty in obtaining ingots.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 104

Buffalo—Donner-Hanna Coke Corp., plans to spend nearly $1 million on the erection of 36 coke ovens and for the general rehabilitation of existing units. The Koppers Co., Pittsburgh, has received the contract to build the ovens.

Chicago—Mills are divided over the question which is in shortest supply, iron ore or coke. One mill is bringing ore in all-rail to augment stocks. Another is buying coke in the open market. Foundrymen are on restrictd allocation for both pig iron and coke.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 104

Cleveland—Step-up in inquiry for washers is keeping pace with that in the bolt and nut industry. Prices are firmer with leading producers quoting list to 50 cents per 100 lb off list. The list price applies generally to orders for 200 lb while the discount applies to orders for 400 lb or more.

Pig Iron . . .

Pig Iron Prices, Page 100

Cleveland — Merchant pig iron sellers here are not following along on the advance of $3 per ton posted a week ago by a Pittsburgh district producer. Despite higher costs and mounting demand they are holding the line. Meanwhile, demand is more pressing than it has been for a long time past, foundries have become noticeably inventory-conscious since outbreak of the Korean war and are trying to stockpile. In addition foundry melt has been stepped up as result of heavier castings orders from consumers anticipating government controls. Gray iron shops are operating around 90 per cent of capacity, and only a relatively small part of output is for military account. Iron is being provided in sufficient tonnage to support foundry melting schedules, but there is no surplus supply and furnace shipments are being parcelled out to buyers on the basis of past monthly purchase records. This is being done to distribute available tonnage as equitably as possible.

Pittsburgh—Sharp increases in raw material costs, higher wages and advances in freight rates prompted Pittsburgh Coke & Chemical Co. to raise pig iron prices $3 per ton, effective July 24. Company is quoting the following at Neville Island, Pa., furnace: No. 2 foundry and malleable, $49.50; and bessemer, $50. At least temporarily, the company is not producing basic iron.

Pittsburgh Steel Co. advanced its price $5 on limited tonnage of basic iron to $51 per gross ton.

The Neville Island merchant stack, blown in July 15 following relining is expected to reach capacity output this week. It is on malleable. The No. 3 Sharpsville, Pa., stack of Shenango Furnace Co. was scheduled to be blown in late last week, after being idle since early June for complete relining.

Large number of inquiries for iron from foundries outside this district indicates growing tightness in supply.

Boston—With vacations over shipments of pig iron to foundries are up slightly. No immediate concern is held for supply of foundry iron. The district producer holds sizable inventory and is operating around two-thirds capacity. If iron is allocated most shops here expect to be covered. Bulk of district steel production is on foreign basic iron.

New York—Stimulated mainly by the Korean crisis, July pig iron sales here will exceed June, despite suspensions for vacations at various foundries. Not only has casting demand been stronger, as a partial result of the emergency, but consumers have stepped up specifications in greater ratio in an effort to build up inventories.

Eastern pig iron sellers are holding prices unchanged.

Philadelphia — District pig iron sellers are completing a highly active month, as consumers are experiencing sharp improvement in business and are endeavoring to build up inventories. A number of district foundries which had been operating an average of four days a week not so long ago are now working five and six days a week and are stepping up their daily melt. Purchases of foreign iron are increasing.

Buffalo—Pressure for deliveries is increasing. Pickup in demand is general. Manufacturers of appliances are rushing to build stocks in event of government allocation. Plumbing and building industries are calling for heavier tonnages. Inquiries also are received from Canadian buyers.

Cincinnati—Decided upturn in pig iron demand is noted. Melters are specifying more actively for early shipment, and they are anticipating needs farther ahead. Sellers indicate limited furnace stocks will block melters' move for heavier inventories.

Chicago—Pig iron demand is strong despite foundry vacation shutdowns. Melters seek more iron than is available locally, most of the demand being for current requirements. Forty-one of the district's 42 stacks are in blast. There is little purely military castings business active here. Civilian needs have brought several gray iron shops to life in recent weeks. Pig iron producers here show no sign of following scattered price advances elsewhere.

Birmingham—Uptrend in demand for pig iron continues. Sales for July, however, may be down due to vacations.

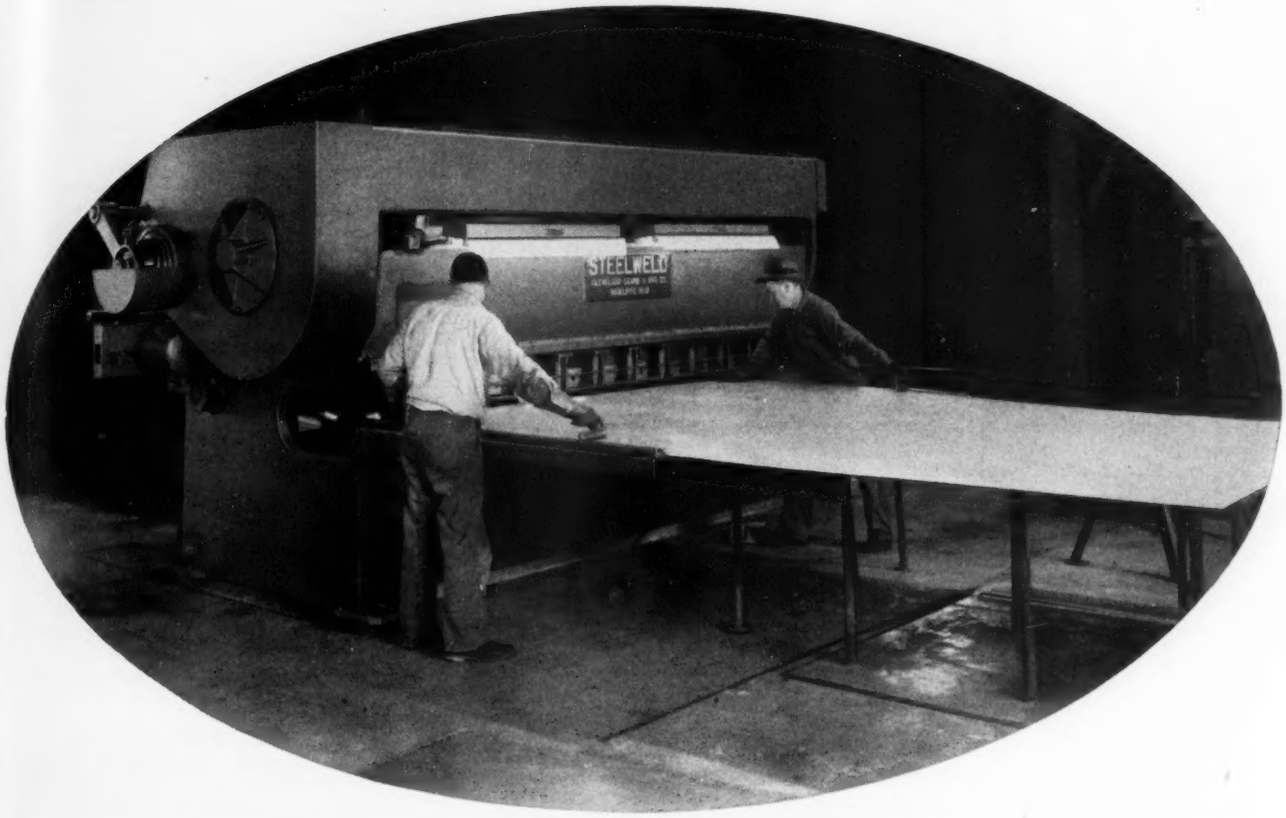
Dallas, Tex.—Lone Star Steel Co. has posted new prices of $41.50, furnace, on basic iron, $42 on No. 2 foundry, and $42 on malleable.

Iron Ore . . .

Iron Ore Prices, Page 105

Cleveland—With more than one-third of the lake shipping season completed, deficit in tonnage of Lake Superior iron ore moved to lower lake ports is large. The season's cumulative total to July 24 is 31,054,697 tons compared with 42,958,168 for the like period a year ago. Total from United States ports is 30,354,704 tons, 11,970,110 tons below the corresponding 1949 figure. Shipments from upper lake ports amounted to 2,816,479 tons in the week ended July 24 against 2,718,792 the like week a year ago.

Small amount of taconite pellets was received at Cleveland last week for shipment to Youngstown Sheet & Tube Co. for experimental pur-



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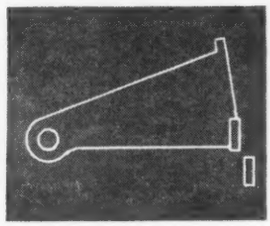

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poses. Three to four carloads were involved in the shipment and the pellets were mixed with other ore. Pickands, Mather & Co. produced the pellets in its taconite pilot plant at Aurora, Minn. Further shipments are planned.

Scrap . . .

Scrap Prices, Page 108

Pittsburgh—Scrap price levels are unchanged at $41 per ton for No. 1 heavy melting, $35 for No. 2 heavy melting, and $34 for No. 2 bundles. Reversal of the downtrend in No. 1 heavy melting and No. 2 bundles quotations about 10 days ago has not yet spread to other scrap grades despite stronger price undertone throughout entire scrap list. Brokers and dealers are experiencing considerable difficulty in covering $41 orders at a profit due at least in part to fact there is considerable tonnage still outstanding at higher prices. Top quality heavy melting steel can not be shipped here from the East for less than $41.30.

Since present record steel production is not adversely affected due to lack of scrap, the trade believes there is no need for immediate enforcement of distribution directives to meet expanding war requirements for steel and castings. Similarly it is hoped that a runaway upward price trend will be avoided thus preventing return of price controls. Some trade officials guess that, in event price controls materialize, No. 1 heavy melting steel will be fixed at about $40 Pittsburgh, $38 for No. 2 heavy melting and $36 for No. 2 bundles. Possibility of still lower price levels of about $35 for No. 1 heavy melting under price control is ruled out on basis of high collection and segregation costs in form of sharp advances in wages, freight rates, and cost of cranes, rails and other yard facilities in recent years.

Chicago—Entry into the market of a major mill late last week broke a stalemate that the trade had been fearful would last until some government move toward allocation and conceivably price control might be announced. Buying was at slightly higher prices than had previously been paid by other mills. No. 1 heavy melting and No. 1 bundles are $38; No. 2 heavy melting, $36; No. 2 bundles, $31. Meanwhile, dealers are shipping scrap out of yard stocks and avoiding taking more scrap than is absolutely necessary from collectors and industrial accounts. Mills have been restricting intake also, working down inventory in event a price ceiling is imposed.

Philadelphia—Mill buying of steel scrap is light, although the general undertone of the market is strong. Prices of $33 for No. 1 heavy melting and $31 for No. 2 are the last reported on these grades. However, some question exists as to whether they can be duplicated.

Machine shop turnings are slightly stronger at $24, delivered, and low phos punchings and plate scrap, electric furnace grade, and low phos plate scrap, 5 ft. and under, are up $1 to $39-$40.

Cast grades are unchanged, except for malleable which is up $2 to $45, delivered.

New York—Brokers' buying prices have been revised on some grades. No. 1 heavy melting steel and No. 1 bundles are now $30, f.o.b. shipping point; short shovel turnings, $21-$22; and punchings and plate scrap and low phos plate, 5 ft. and under, $31-$32. Cast scrap prices are steady.

Situation in steel mill scrap is somewhat mixed. Consumers are showing lively interest, but recent orders have not been heavy; in fact, a few mills have rejected some shipments recently. A strengthening factor is the slower movement of scrap from industrial plants due to suspensions for mass vacations.

Boston—Scrap market is slightly stronger. Prices of most steel grades are 50 cents a ton higher, except borings and turnings which are unchanged. Buying is rather slow. Yard stocks are fairly large.

Detroit — Closing of large automotive lists and the return of steel mills to scrap buying on a large scale drove the market higher right down the line by $1 to $3. No. 1 bundles hit $39.50 and are expected to climb further. Increases in pig iron prices have been reflected in the higher quotation on cast scrap, the boost averaging at least $1. Part of the scramble by mills to contract for large automotive tonnages springs from the belief that should the military situation dictate cutbacks in auto output a shortage of high-quality production scrap could result this winter, hence, the decision to lay down as much as possible now. Greatest pressure, of course, is on open-hearth grades.

Buffalo—Steady to strong tendencies prevail in the scarp market. Efforts are being made to restrain advancing prices as long as possible. Prices on steelmaking grades are unchanged, but both buyers and sellers appear unwilling to do business at this time at prevailing levels. Orders for approximately 1500 tons of cupola cast were placed within the quoted range of $34.50-35.

Cleveland—Undertone of the scrap market is somewhat stronger. Consensus of brokers and dealers here is that slightly higher prices, representing advances of perhaps $1 a ton, may be posted when mills make expected large commitments in August. At present, mills are taking in substantial tonnages on old contracts and are in a satisfactory position regarding their scrap supplies. Threat of government control if prices get out of hand, coupled with brokers' recognition of their responsibility to keep mills supplied with scrap at fair prices during the present emergency, is acting as an effective check on the market.

Cincinnati — Scrap prices are unchanged. Contracting for August tonnage may help clarify the somewhat confused situation. Foundry buying is more active.

Birmingham—Scrap prices have moved moderately upward in several instances although no major tonnage movements are reported here.

Los Angeles — Demand for steelmaking scrap is stronger. Producers seek to replenish depleted stockpiles. Supplies are far from adequate and dealers are looking for remote scrap as far east as Arizona. Prices are steady.

San Francisco—No changes have been made in prices of steel-making grades, but there is considerable uncertainty over future trends as a result of the war.

Vancouver, B. C. — Scrap supply situation is satisfactory, local demand consuming supplies locally available. Mills are paying $18.75-$20.75 for heavy melting, the higher level covering cartage. Cast iron scrap is quoted $35-$37.50.

Warehouse . . .

Warehouse Prices, Page 105

New York — Warehouses are swamped with inquiry and stocks are being reduced rapidly. At least one leading distributor is completely cleaned out of all hot and cold rolled sheets.

Philadelphia—Warehouses report heavy demand for practically all products. Some say July will be the most active month so far this year. Stocks are shrinking rapidly.

Pittsburgh—Increase of 10 to 15 per cent in daily average shipments from warehouse stocks is expected this month. Distributors are rejecting orders from customers seeking to supplement inadequate tonnage received from their regular mill suppliers. Some distributors are four to five days behind on deliveries and warehouse stocks are becoming badly depleted in shapes, plates, sheet and strip items.

Cleveland—Distributors are finding it necessary to screen orders carefully with consumers seeking to make up mill shipment deficits from warehouse stocks. Were they to accept all the orders coming to them they would be cleaned out quickly of virtually everything. Demand is especially strong for the flat-rolled products, with plates increasingly under pressure. As military demands arise supply conditions are expected to worsen and in anticipation of this the warehouses are preparing to care for their old customers before considering business from newcomers.

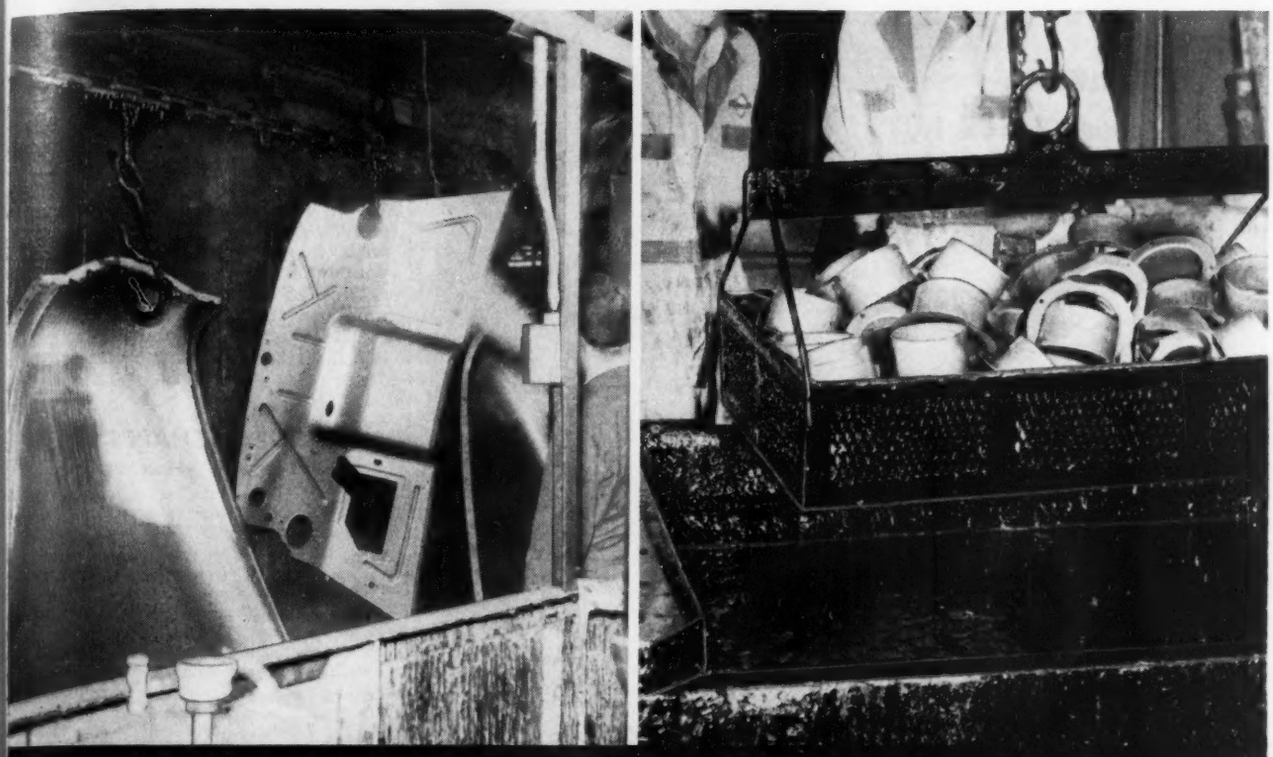
Cincinnati — Stocks are shrinking under heavy demand from fabricators. Prices are unchanged.

Birmingham—Warehouse demand has increased measurably the past week to 10 days. Most of the pickup is due to the war scare.

Los Angeles—Sales are spurting as fabricators seek to stock up. Warehousemen, to keep shrinking inventories in balance, are ordering heavily from mills.

San Francisco—Distributors report steady pressure from fabricators for all hard-to-get items, chiefly light, flat-rolled steel. Business is active and July volume is expected to show a gain over that of June.

Vancouver, B. C.—Warehouses report sheets and light plates as scarce. Reinforcing bars and shapes are in adequate supply. Demand for sheets is active. More than 1000 tons of bolts, nuts and tie plates for the Pacific Great Eastern are being supplied by local producers. Heavy plates are imported from England; structurals, from the European continent.



Automobile parts being protected for export shipment. (Left) Hoods and cowls pass through continuous criss-cross spray of NO-OX-ID before crating. (Right) Small parts are dipped in NO-OX-ID.

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Whether you manufacture products for export or domestic markets —if they are made of metal, they need protection against the costly, constant threat of rust.

Whether your products require a coating that is transparent, heat resisting, cold resisting, lubricating or dry to the touch, there is a correct NO-OX-ID for your use. There is also a method of application suited to your operation. NO-OX-ID may be applied by hot or cold dip—either by hand or conveyor. It may be sprayed or brushed on—it may be protected in NO-OX-IDized wrappers.

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Dearborn has been serving industry since 1887—put these years of experience to work for you, preventing corrosion on your products and in your plant. Consult with a Dearborn Engineer—he will advise you as to which NO-OX-IDs are best suited to your needs.

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NO—OX—ID
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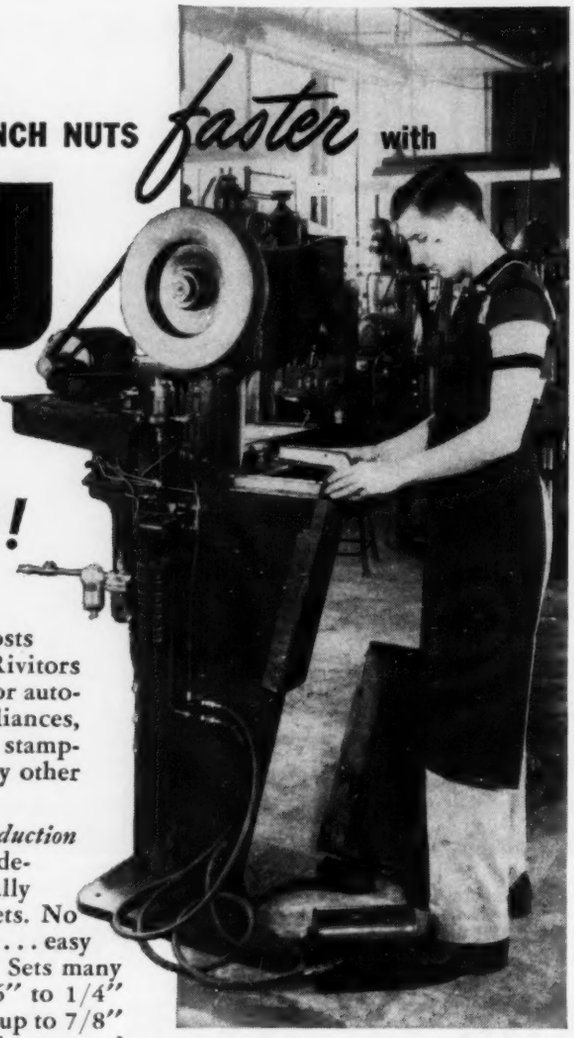
REDUCE COSTS!



Speed up assembly operations . . . bring costs down . . . with T-J Rivitors and Clinchors! Ideal for automotive, household appliances, farm machinery, toys, stampings of all kinds, many other uses.

You get *high production* with T-J Rivitors . . . designed to automatically feed and set solid rivets. No manual rivet handling . . . easy for women operators. Sets many types of rivets . . . 1/16" to 1/4" diam. solid steel rivets up to 7/8" long using *electrically powered* Rivitor . . . aluminum alloy rivets up to 1/4" diam. or steel rivets up to 1/8" diam. and up to 3/4" long, using *air powered* Rivitor. Throat depths, 8" to 36".

T-J CLINCHOR . . . available in Underfeed (shown here) and Gravity feed models. Capacity of standard machines is 9/16" O.D. to 3/4" O.D. "D" type clinch nuts, 17/32" to 29/32" square "Case" type clinch nuts, and extruded type clinch nuts. Range of throat depths, 8" to 36".

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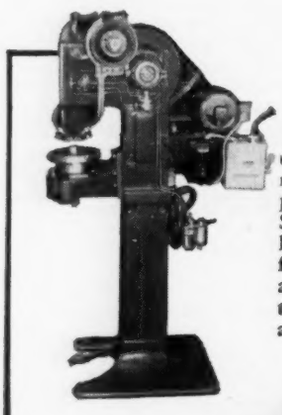
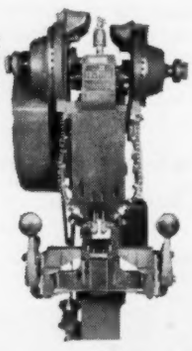


T-J RIVITOR used for automotive clutch plate assembly. Saves time and labor doing a four-fold job—assembling, setting, inspecting and ejecting.

TWIN RIVITOR used for riveting flat steel springs to mounting brackets for automobile horns.



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TOMKINS-JOHNSON

RIVITORS . . AIR AND HYDRAULIC CYLINDERS . . CUTTERS . . CLINCHORS

Gray Iron Castings Orders Rise

Washington—Average daily shipments of gray iron castings in May were about equal to those in April, but 21 per cent above May, 1949, reports the Census Bureau. Shipments totaled 1,095,111 short tons in May, 981,126 in April and 866,631 in May, 1949. Total for the first five months came to 4,849,529 tons compared with 4,897,576 in the like period a year ago.

Unfilled orders for sale to the trade amounted to 977,833 tons at the end of May, or 55,578 above April, but 265,433 less than at the end of May, 1949.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2600 tons, power station, American Gas & Electric Co., Lawrenceburg, Ind., to the Ingalls Iron Works, Birmingham, Ala.

2000 tons, No. 37, New Jersey turnpike, through Conduit Foundation Co., Philadelphia, to American Bridge Co., Pittsburgh.

1200 tons, office building, Tishman Construction Co., Los Angeles, to Bethlehem Steel Co.; two additional buildings for Tishman in Los Angeles, pending.

1100 tons, building, University of Wisconsin, Madison, to American Bridge Co., Pittsburgh; Gust K. Newberg Construction Co., Chicago, contractor.

1100 tons, state road work, Bronx, New York, to Mt. Vernon Bridge Co., Mt. Vernon, O.

1000 tons, Middlesex trading center, Jordan Marsh Co., Natick, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; George H. McComber Co., Boston, general contractor.

652 tons, Public School No. 192, Bronx, N. Y., through Caristo Inc., Brooklyn, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.

515 tons, reclamation of state bridges, Burlington and Mercer counties, New Jersey, to American Bridge Co., Pittsburgh.

475 tons, No. 24, New Jersey turnpike, to Ralph Conner.

410 tons, state highway bridge, Adams, Mass., to American Bridge Co., Pittsburgh; Henry Lundgren Co., Shrewsbury, Mass., general contractor.

400 tons, overpass on Tri-State highway, Hammond, Ind., to American Bridge Co., Pittsburgh; Arcole Midwest Corp., Chicago, contractor.

340 tons, dormitories, Brown University, Providence, R. I., to A. O. Wilson Structural Co., Cambridge, Mass.; Gilbane Construction Co., Providence, general contractor.

300 tons, warehouse, H. Pape Inc., Queens, N. Y., to Bethlehem Steel Co.

230 tons, No. 25, New Jersey turnpike, to Bethlehem Steel Co.

230 tons, Berg Memorial Hospital, 5th Ave. and 68th St., New York, to Elizabeth Iron Works, Elizabeth, N. J.

205 tons, Bell Telephone exchange, Ardmore, Pa., to Bethlehem Steel Co.

170 tons, state road work, New York county, New York, through Poierer & McLane, to Bethlehem Steel Co.

150 tons, New York state bridge work, to Bethlehem Steel Co.

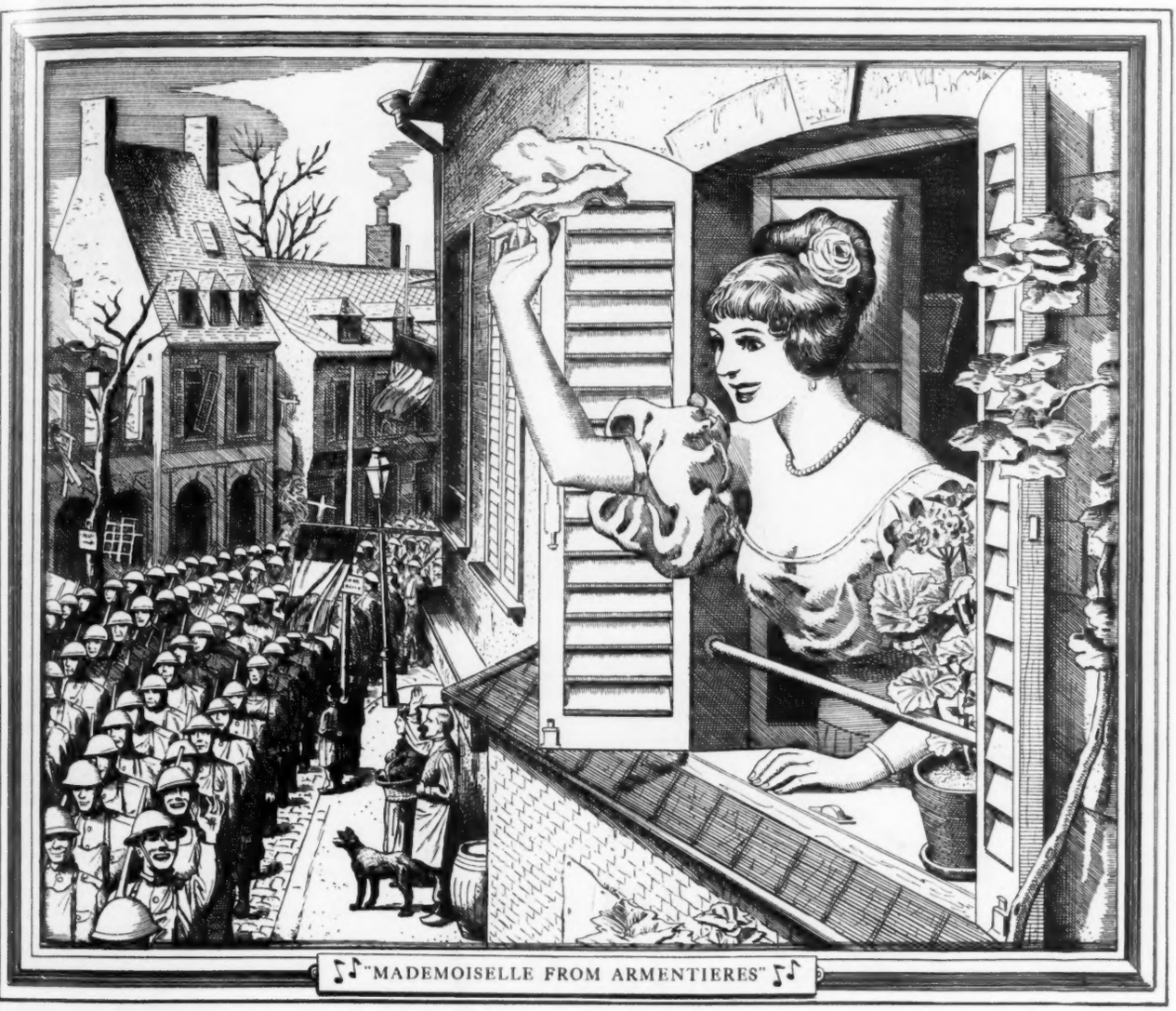
100 tons, Du Pont laboratory extension, Wilmington, Del., to Bethlehem Fabricators Inc., Bethlehem, Pa.

100 tons, state bridge, Blair county, Pennsylvania, to Bethlehem Steel Co.

Unstated, 125-ton gantry crane for Hungry Horse dam, to Willamette Iron & Steel Co., Portland, Oreg., by Bureau of Reclamation, Denver.

STRUCTURAL STEEL PENDING

4000 tons, Lever House office building, Park Ave. and 53rd St., New York; bids close Aug. 1.



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ALBERT F. ROCKWELL

(Seventh President of BRISTOL BRASS*)*

Pioneer maker of ball bearings, of the bicycle coaster brake, of the push-doorbell . . . no-quarter fighter for metallurgical progress . . . expander and commander of the Bristol mills through World War I, when he tripled production

STORM center of the Bristol Brass board of directors, the warlike Rockwell became president in 1911, in a world smouldering into war. Woodrow Wilson was elected the next year. And in China, Sun-Yat-Sen set up the first republic. In Germany, Socialists seized power. Then an obscure Austrian archduke was murdered, and the world burst into flames.

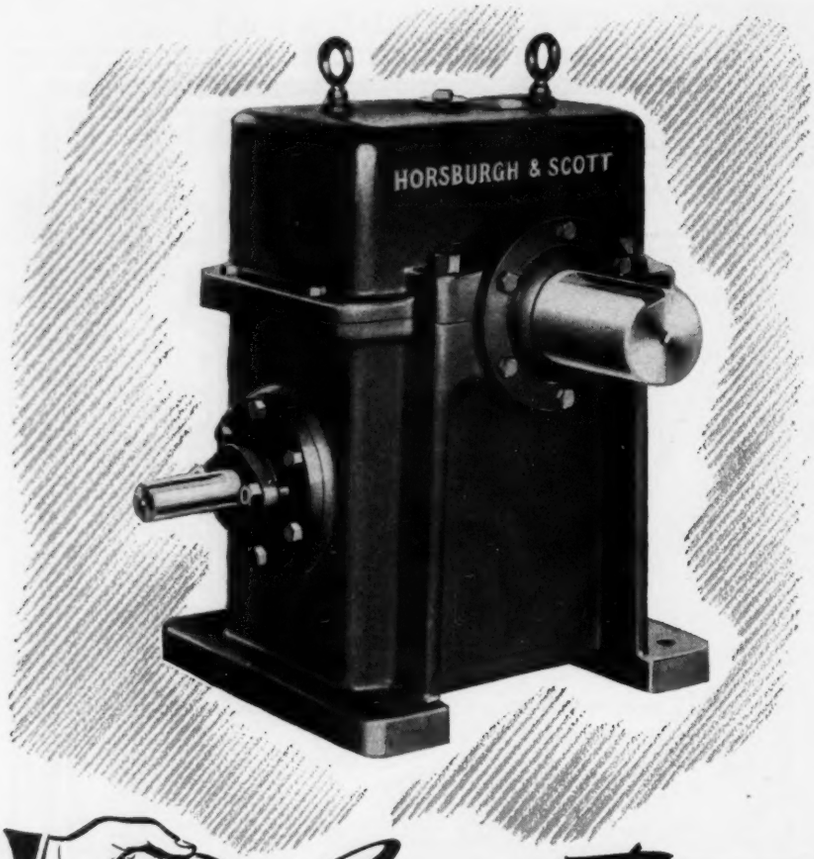
As far as Bristol Brass was concerned, Albert Rockwell was exactly the man for the moment. Far-visioned, quick-moving tactician, he kept his fellow directors in an uproar with his ideas of expansion . . . including a new mill, and a new metallurgical laboratory to take the abracadabra out of Brass-casting. Under Rockwell, the payroll rocketed from 300 to 1,000 . . . tent cities and housing developments mushroomed . . . the mill ran day and night . . . and cartridge Brass rolled out by the ton until Armistice Day, 1918.

Then, Bristol Brass modernized and forged ahead by installing extrusion machines, "overhauling" machines, and tandem rolling mills. And history is repeating itself now, after World War II, by modernization with controlled-atmosphere furnaces, continuous casting, and the most modern equipment available, with which to produce Brass sheet, rod, wire, and extruded shapes. All of which means that *you* can't get any better Brass, any quicker, *anywhere*, than you can from Bristol.

One Hundred Years of BRASS made "BRISTOL FASHION"

Like the world-famed merchant ships from Bristol, England . . . Always prompt, shipshape, reliable

The BRISTOL BRASS CORPORATION, *makers of Brass in Bristol, Conn. since 1850*



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WORM GEAR SPEED REDUCERS

by Horsburgh & Scott

An important feature of Horsburgh & Scott Worm Gear Speed Reducers is compactness . . . reducer can be mounted as a unit on driven machines . . . making possible its use where other drives might interfere with aisles, walls or other machinery. Designed for simplicity with only two moving parts, this precision unit has 10 outstanding advantages and is obtainable in 8 types with reductions from 3⅝ to 1 up to 10,000 to 1 . . . right-angle drives available in ratios up to 700 to 1.

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THE HORSBURGH & SCOTT CO.

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5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

5347 tons, No. 38, New Jersey turnpike, Middlesex and Union counties; general contract award to Braun & Stuart Co., Philadelphia; bid $4,648,392.95.

1500 tons, 11 steel stringer bridges, Massachusetts; pending.

1500 tons, Mt. Wilson State Hospital, Baltimore; general contract to Cramer Vollmerhauser, that city.

1055 tons, No. 41, New Jersey turnpike, Mercer and Middlesex counties; Construction Service Co., Bound Brook, N. J., general contractor; bid $1,080,913.

1000 tons, University of Maryland Hospital, Baltimore; general contract to Joseph Hughes, that city.

1000 tons, manufacturing buildings, Martinsville, Va.; bids closed.

1000 tons, No. 40, New Jersey turnpike, Salem county; bids Aug. 8.

560 tons, No. 56, New Jersey turnpike, Hudson county; bids Aug. 10.

500 tons, Pennsylvania Railroad overpass, Baltimore; bids closed.

500 tons, library, Northeastern University, Boston; bids direct on steel.

225 tons, state bridge, Essex and Morris counties, New Jersey; bids Aug. 8.

157 tons, state bridge, Washington and Allegheny counties, Pennsylvania, bids Aug. 11.

145 tons, state bridge, Allegheny county, Pennsylvania; bids Aug. 11.

120 tons, Snoqualmie river bridge, King county, Washington; Anderson Bridge Co., Tacoma, Wash., low $119,955.

109 tons, including 25 tons reinforcing bars, Savage river bridge, Alaska; Breeden & Smith, Anchorage, Alaska, low $84,965 to Alaska Road Commission; government to furnish materials including 2520 lineal feet steel piling.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1400 tons, section, Major Deegan state expressway, Bronx, New York, to Truscon Steel Co., Youngstown, O.

900 tons, New York state road work, New York city, through Johnson Drake & Piper, to Truscon Steel Co., Youngstown, O.

644 tons, Pennsylvania turnpike sec. 30F, Allegheny county, Pennsylvania, to Electric Welding Co., Pittsburgh.

440 tons, Akron expressway system, Summit county, O., to Pollack Steel Co., Cincinnati.

435 tons, auxiliary outlet sewer No. 2, Chicago, to United States Steel Supply Co., Chicago.

280 tons, sewage treatment plant, Altoona, Pa., to United States Steel Supply Co., Pittsburgh.

REINFORCING BARS PENDING

1500 tons, southerly sewage disposal plant, Cleveland; bids asked.

1500 tons, No. 38, New Jersey turnpike, Middlesex and Union counties; general contract awarded to Brann & Stuart, Philadelphia.

565 tons, paving LR 763 routes U. S. 22 and 30, Allegheny county, Pa.; bids asked.

480 tons, No. 41, New Jersey turnpike, Mercer and Middlesex counties, general contract to Construction Service Co., Bound Brook, N. J.

445 tons, No. 39, New Jersey turnpike, Union county; general contract to Koppers Co. Inc. (Metal Products Division) Baltimore; also 3500 feet of steel bearing piles.

371 tons, sec. 29A, Pennsylvania turnpike, Lawrence county, Pennsylvania; bids asked.

364 tons, building, Moody Bible Institute, Chicago; bids asked.

355 tons, St. Lukes Hospital, Racine, Wis.; bids asked.

353 tons, Memorial Library, University of Wisconsin, Madison; bids asked.

350 tons, No. 32, New Jersey turnpike, Union county; general contract to Napp Grecco Co., Newark, N. J.

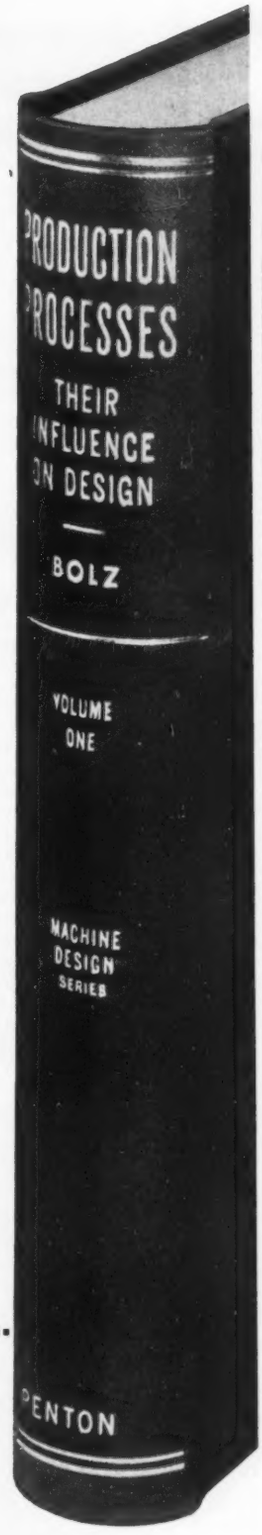
325 tons, Salem Avenue bridge, Dayton, O.; bids asked.

Take the "Guesswork" out of your designs . . .

Production Processes

THEIR INFLUENCE ON DESIGN

by ROGER W. BOLZ



HERE'S a "working tool" that will help you take the "guesswork" out of your designs. It's the answer to the problem of how to design specifically for production. It puts at your instant command the facts and figures you need to know about the various production processes . . . and how they influence your designs.

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PRODUCTION PROCESSES is packed from cover to cover with facts and figures on 36 different processes. When you want to design a new part or improve a present design, you will find in its pages every fact that has a bearing on your work. When you want to know the character, scope, capabilities, or limitations of a process—you will find it in this book, simply and clearly explained.

PRODUCTION PROCESSES thoroughly covers all the different design factors involved in Metal Removal, Forming, Working, Forging and Deposition. It gives you down to earth data on such factors as how to select materials . . . the surface finishes produced by various processes . . . and the practical tolerances which can be held while using various processes.

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What production factors should be considered in design? . . . What pitfalls should be avoided in designing? . . . What level of precision can be maintained in mass production without exceeding normal costs? . . . What are the minimum production levels below which costs may be excessive? . . . When are the various production processes used?

Four years ago MACHINE DESIGN started a continuing series of articles on production processes and their influence on design. Soon, design and production men all over the country began to request that the series be expanded into book form. This new book by Roger W. Bolz is based upon the series of articles which appeared in MACHINE DESIGN up to September, 1948. Every chapter has been entirely rewritten, expanded and revised to include all the pertinent factors not possible to cover in a magazine article.

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Roger W. Bolz, Associate Editor of MACHINE DESIGN, is an acknowledged authority in the field. His book puts design on a rational basis. It will help you save money by avoiding costly design errors before production even begins. It will show you how the parts you design are actually produced, it will acquaint you with the different production processes and show you the pitfalls to avoid when designing for these processes.

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Why not decide for yourself what a useful book this can be to you? Just fill in the certificate and mail it today. It will bring you a copy of PRODUCTION PROCESSES by return mail. Examine the book FREE for ten days—at the end of that time send us your check for $10. plus a few cents for postage — or return the book absolutely without obligation. Just fill-in and mail the free examination certificate now.

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SI 6-19-50

Do you know how much the springs you buy actually cost?

WHEN you calculate the cost of your springs, don't stop with the price billed by your springmaker. Get the whole picture by taking into consideration *all* the costs . . . the inspections necessary . . . the delays caused by rejects . . . the hitches in your assembly resulting from spring imperfections. With this data at hand your spring costs may take on an entirely different character.

Take the case of a small spring which previously required two operations in manufacture, one by machine and one by hand, followed by careful inspection and a high rate of rejection. Accurate's skilled springmakers developed the tooling necessary to produce this spring in one machine operation with unvarying accuracy. Unit cost was substantially reduced, inspection and rejects were eliminated. The combination of all these savings was mighty important.

Why not let Accurate engineers appraise your spring requirements . . . the chances are they can cut the overall cost of your springs. Write today.

Accurate Springs

A *dependable* source of supply!

ACCURATE SPRING MFG. CO.
3823 W. Lake St. • Chicago 24, Ill.

Springs, Wire Forms, Stampings

318 tons, state bridge work, Washington and Allegheny counties, Pennsylvania; bids Aug. 11.

272 tons, No. 40, New Jersey turnpike, Salem county; bids due Aug. 8.

256 tons, power plant, Voltaire, N. D.; bids asked.

242 tons, building, American Brass Co., bids asked.

172 tons, No. 56, New Jersey turnpike, Hudson county; bids Aug. 10.

106 tons, National Guard hangar, General Mitchell field, Milwaukee; bids asked.

100 tons, engine plant superstructure, Ford Motor Co., Cleveland; bids asked.

PLATES . . .

PLATES PENDING

700 tons, tank work, Pan American Petroleum Co., Wilmington, Del., to Chicago Bridge & Iron Works, Chicago.

337 tons, tank work, New Haven, Conn., to Bethlehem Steel Co.

RAILS, CARS . . .

RAILROAD CARS PLACED

Canadian National, 6 self-propelled coaches and 12 trailers to Canadian Car & Foundry Co., Montreal.

Lehigh Valley, 300 seventy-ton mill-type drop-end gondola cars, to Bethlehem Steel Co.

Metropolitan Transit Authority, Boston, 25 trolley cars, to Pullman-Standard Car Mfg. Co., Chicago. These are in addition to 25 reported placed with this builder recently.

Reading, 1000 hopper coal cars, to Bethlehem Steel Co. This is in addition to 1000 cars placed recently.

Wabash, 500 fifty-ton box cars, to own shops at Decatur, Ill.

RAILROAD CARS PENDING

Delaware, Lackawanna & Western, 500 seventy-ton drop-end gondola; bids asked.

Fruit Growers Express, 1000 forty-foot steel refrigerator cars and 100 fifty-foot steel refrigerator cars; pending.

Reading, 500 seventy-ton mill-type drop-end gondolas; bids asked.

RAILS PLACED

Chesapeake & Ohio, 15,659 gross tons of rails, to Carnegie-Illinois Steel Corp., Pittsburgh; 12,291 tons to Inland Steel Co., Chicago; and 4037 tons to Bethlehem Steel Co., Bethlehem, Pa.

FERROALLOYS

(*Continued from Page* 105)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.), Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.65c per lb of alloy, ton lots packed 9.05c, 200 to 1999 lb 9.40c, smaller lots 9.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3⅜ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained, F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C

3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6, 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Trungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., frt allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min. C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%; Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca. 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum., 95.00c.

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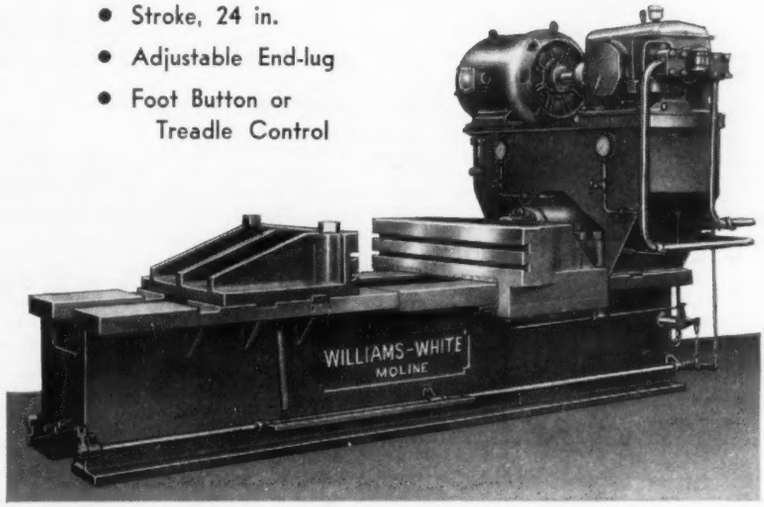

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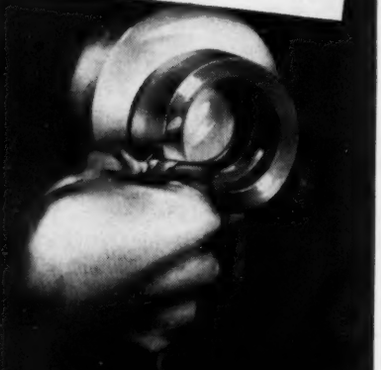

In the operation shown here, a carbide drawing die is being polished to a long life mirror finish in less than 10 minutes with Elgin Dymo Diamond Compound. Grade 14 is used to size and pre-polish the die followed by Grade 6 for mirror polishing. The die rotates at 2200 r.p.m. Soft copper polishing tools and wood sticks are used to apply the compound.

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE
ORGANIZATIONAL CHANGES

California

American Can Co., New York, started construction of a $450,000 building adjoining its Oakland, Calif., plant. The structure will house the lithographing and coating department and provide tinplate storage facilities. Swinerton-Walberg, San Francisco, is the contractor. The building will be finished next May.

California

Standard Oil Co. of California, San Francisco, will start construction soon of the world's largest vacuum flashing unit at its oil refinery at Richmond, Calif. The unit will have a charging capacity of 55,000 barrels of reduced crude petroleum daily, exceeding by about 15 per cent the largest such unit now in operation. Cost of the unit will be about $1,750,000. Construction will be handled by M. W. Kellogg Co., Jersey City, N. J. Completion is scheduled for next May.

California

Tishman Realty & Construction Co. Inc., New York, started construction of three 12-story office buildings on Wilshire boulevard, Los Angeles. First building of the $12 million project, including a two-story garage and retail shop, is scheduled for completion May 1, 1951. Claude Beelman is architect; C. L. Peck, general contractor.

California

Broadway Plumbing Co. bought a $75,000 one-story building in San Francisco as its warehousing, fabricating and office headquarters.

Michigan

Lovejoy Tool Co. Inc., Springfield, Vt., appointed C. B. DeKorne, Grand Rapids, Mich., as its sales representative for western Michigan. Lovejoy is a manufacturer of milling cutters, boring heads, arbors, counterbores, and mills, flywheels, etc.

Delaware

Ramset Fasteners Inc.—machinery and tools—filed a charter of incorporation with the secretary of state, Dover, Del. Capital of the firm is listed at $102,000. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Delaware

Frear Machine Co.—machinery—was chartered by the corporation department of the secretary of state's office, Dover, Del. Max Terry, Dover, is serving as resident agent.

Florida

Continental Can Co., New York, is building a $1.5 million can manufacturing plant at Auburndale, Fla.

Florida

Gulf Power Co., Pensacola, Fla., plans a $4.4 million expansion program that includes installation of a 30,000 kilowatt steam-electric unit in new generating station at a cost of $3,760,000, and construction of transmission lines and substation facilities costing $650,000.

Georgia

Graver Water Conditioning Co., New York, appointed Evans L. Shuff & Associates as its representative for the Atlantic territory. Graver is a manufacturer of equipment for all kinds of water treating processes.

Illinois

Industrial Filter & Pump Mfg. Co. moved to its newly acquired location at 5900 Ogden Ave., Chicago 50.

Maryland

The Surgical Engineering Co., Baltimore, is equipping 5000 sq ft for the manufacture of surgical instruments and appliances used in bone surgery. John G. Collison, president, formerly operated a similar plant at Greensboro, N. C.

Maryland

Glenn L. Martin Co., Middle River, Md., has developed an oxide process in which the oxide film is applied by an electrochemical process to aluminum, the result being a substantial increase in abrasion resistance. The process is said to improve aluminum's transient resistance to heat. For abrasion-resistance purposes the film coating is usually 0.002 inch in thickness.

Maryland

Colonial Iron Works, Baltimore, has moved into larger space in a building to the rear of 4526 Harford Rd.

Maryland

Steel Erection Service Inc., Baltimore, has moved from 3700 Gough Street, into larger quarters at 269 S. Grundy St.

Maryland

National Sash Weight Corp., Baltimore, is replacing its pattern shop with a modern concrete structure.

Michigan

Darin & Armstrong Inc., Detroit, was awarded the contract for an addition to the manufacturing plant of **Fisher Body Division,** General Motors Corp., in Grand Rapids, Mich.

Michigan

Congress Construction Co., Detroit, is erecting a smelting plant on Mt. Elliott avenue, Detroit, for the **Industrial Smelting Co.,** that city.

Michigan

American Box Board Co., Grand Rapids, Mich., is constructing a $1 million plant in that city. Operations of the company's two plants in that city will be consolidated in the new plant. About the same amount is being expended on the Manistee, Mich., plant.

Michigan

Owens - Ames - Kimball Co., Grand Rapids, Mich., has the general contract for a $1 million die-casting plant in that city for the **Doehler-Jarvis Corp.,** New York.

Michigan

Campbell Construction Co., Detroit, is the general contractor for a manufacturing building in Ferndale, Mich., for **Acme Mfg. Co.,** Detroit; a factory and office building at Birmingham, Mich., for **Temprite Products Corp.,** Detroit; a factory addition in Ferndale for **Punch Press Repair Corp.**

Michigan

Hertner Electric Co., Cleveland, appointed Kohler-Pasmore Co., Detroit, as its representative in Michigan. Hertner makes motors and generators and motor-generator battery chargers for electric trucks, and sets for specialized electrical installations.

Missouri

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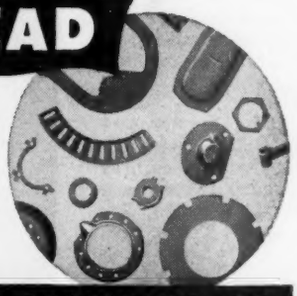

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Chamber of Commerce's Industrial Development Fund will receive bids until July 31 on the construction of a factory building to be leased to the **R. Lowenbaum Mfg. Co.**, St. Louis. Wischmeyer & Lorenz, St Louis, is the architect.

North Carolina

Woonsocket Falls Mills, Woonsocket, R. I., awarded contract to McKoy-Helgerson Co., Greenville, S. C., for a $3.5 million plant in Wilmington, N. C., for manufacture of pile fabrics.

New York

Stauffer Chemical Co., New York, awarded a contract to H. K. Ferguson Co., Cleveland, for construction of a research laboratory at Dobbs Ferry, N. Y. The building was designed by Singmaster & Breyer, New York.

New York

Remington Corp. will move Nov. 1 from Cortland, N. Y., to Auburn, N. Y. The company expects to start production of its air conditioning units in December in one of the buildings formerly occupied by International Harvester Co.

New York

Incinerator Institute of America has been organized to furnish information on the products of its industry. Stewart N. Clarkson is secretary-treasurer with offices at 420 Lexington Ave., New York. The institute will concern itself with the development of standard performance specifications; will work with states on the elimination of stream pollution; will help municipalities in the writing of ordinances and regulations; will co-operate with the Smoke Prevention Association of America Inc. Functions of the institute will include collection and dissemination of trend of business statistics, adoption of standard nomenclature, co-ordination of advertising and publicity programs of members.

New York

Eden Tool & Die Co. has been incorporated in Buffalo with a capital of 500 shares. Incorporators are Frank J. Rettig, Frank J. Rettig Jr., Elizabeth Rettig and Tessie M. Rettig.

Ohio

Harbison-Walker Refractories Co., Pittsburgh, started construction of an office and refractories warehouse at 1986 W. Third St., Cleveland.

Ohio

Werner G. Smith Inc., 228 Commerce Bldg., Cleveland, has been organized to manufacture core oils for sale to foundries. The company also will produce and refine China wood oil as well as other drying oils for the paint and varnish industry.

Ohio

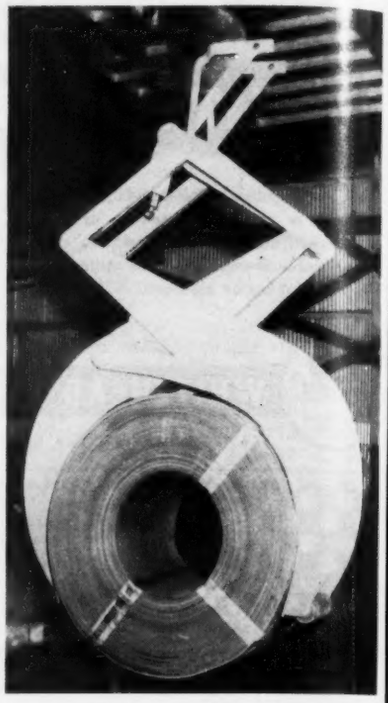
Cleveland Radix Tool Co. has been incorporated to manufacture and deal in machinery, tools, machine shop work, etc. The plant is being set up at 4758 Warner Rd., Cleveland.

Ohio

McKay Machine Co., Youngstown, is building a three-story office building in front of its W. Federal street plant. It will cost about $150,000.

Ohio

Salem Tool Co., Salem, O., will build a $50,000 manufacturing building to be used for welding and assembling operations. A craneway for a 10-ton crane will be installed in the building.



EASY DOES IT: This pair of tongs designed by Heppenstall Co., Pittsburgh, will pick up, transport and deposit coils of strip steel quickly. Here the tongs are shown at work in the Irvin Works of U.S. Steel's Carnegie-Illinois Steel Corp. The automatic tongs are designed so they will lift the desired coil directly up from the stocking area without any distortion of its roundness and without damaging the edges of adjacent coils. Irvin Works finds the tongs conserve floor space and improve housekeeping.

Pennsylvania

Wilkening Mfg. Co., Philadelphia, is appointed product distributor of Petroleum Solvents Corp., New York. The latter company continues to distribute its products through its own organization.

Pennsylvania

Eriez Mfg. Co., Erie, Pa., producer of magnetic equipment, appointed Ponsford-Moos Equipment Co., El Paso, Tex., as its sales representative in Panama, Costa Rica, Nicaragua, El Salvador, Honduras and British Honduras.

Canada

Dana Corp., Toledo, licensed **Hayes Steel Products Ltd.,** Merritton, Ont., to produce automotive axles under Dana patents. Hayes Steel has plants in Merritton, Torold and Red Lake, Ont.

Canada

Dominion Engineering Works Ltd., Montreal, Que., received two contracts, aggregating $2 million, for construction of hydraulic turbines for the New Zealand state hydraulic electric department. The order will take two to three years to complete.

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